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The Sharqî Architecture of Jaunpûr.

THE finely illustrated volume issued under this title* forms the first of a new series of reports, begun after the reorganisation of the Archæological Surveys in Upper India in 1885; and if the work is to be continued on the same scale and with the same thoroughness of illustration, we may look to see at last something like an adequate illustration of a considerable portion at least of the immense and multifarious architectural remains of the Indian Peninsula. This volume, with its seventy-four plates, illustrates a small section of this vast subject, the architecture of one period of a limited district, which occupies only a chapter of half-a-dozen pages in Fergusson's great work on Indian architecture. According to Dr. Burgess's preface, the former class of archæological reports consisted "chiefly of cursory notes on places visited on a flying tour, with rough drawings and photographs of the more notable buildings and sculptures met with, and speculations on matters on which the surveyor did not possess the materials for anything better than a mere hypothesis more curious than scientific"; and one result of this hasty though well-intended work has been that while Dr. Burgess had hoped to utilise much of the material in the shape of drawings executed on surveys previous to 1885, it was found that those drawings, though well-executed, were exceedingly inaccurate as to details, which had not been conscientiously measured or drawn with the requisite care, and it was necessary to re-measure and re-draw the whole of the monuments. The object under the new system has been, we are told, to avoid speculative criticism as to history or style, and to make it the main object to give the ascertainable facts correctly in illustration. The illustrative work has been carried out, for the district under consideration, by Mr. E. W. Smith, in a manner which fully proves his ability and capacity for taking pains. The illustrations have been reproduced at the Survey of India Office in Calcutta, mainly from measured drawings, and in part from photographs, and form a very fine collection of architectural illustrations. Dr. Führer has contributed a short history of the district and of the dynasty of the Mahommedan kings under whom these buildings were carried out.

Anglo-Indian writers are not prone to trouble themselves much about the fact that names and expressions which are familiar to them are as Hebrew to the majority of readers in England; and it is not very easy for the English reader to extract the historical facts from pages bristling with unfamiliar and uncouth-looking words; but we gather that the epithet "Sharqî" applied to the class of monuments treated of here was a kind of dynastic title or affix of the kings who ruled the province, commencing with one Khwâja Jahân, the first independent prince of Jaunpûr, and who received the title of "Malik-as-Sharq," the affix of "Sharq" or "Sharqî" reappearing in connexion with the names of sundry of his successors. The architecture produced under these rulers, therefore, is Sharqî architecture in pretty much the same sense that the architecture produced in England under the four Georges is called Georgian architecture.

A map of the district dealt with would have been a convenient addition to the volume, and we may suggest that this should form a feature in future volumes of the archæological survey. Jaunpûr is near the centre of the northern portion of the peninsula, about fifty or sixty miles in a north-westerly direction from Benares, and situated on the river Gûmti, a tributary of the Ganges. One of its finest monuments is a grand stone bridge, a view of which, reproduced from a photograph, forms the frontispiece to the volume. This however, is a later work than the monuments which form the main subject of the volume, having been built in 1564-8, under the rule of Akbar, who made Jaunpûr and Chunâr alternately his headquarters, and by the governor appointed under him, Munim Khân; and therefore does not properly come under the subject of Sharqî architecture. There is an interesting story related as to the origin of this bridge, to the effect that Akbar, who was fond of water excursions, heard one evening a poor woman lamenting that she could not get ferried across; whereupon he took her across, but subsequently remarked to Munim Khân on the advantage of building a bridge there, and spoke rather contemptuously of the former kings for their preference for building mosques rather than such useful works as bridges. There is a trait of the practical-minded soldier about this which rather reminds one of Napoleon The advice seems to have been acted on with the readiness which might have been expected from a subordinate governor. The bridge has massive piers, and arches of the peculiar pointed shape characteristic of Saracenic architecture, sharply curved at the springing and nearly straight-lined above, and is decorated with four kiosks, two on each of the pieces flanking the centre arch.

The masjids, which form the most important architectural remains of Jaunpûr during the period of the Sharqî rulers, present some architectural characteristics peculiar to themselves. The three special peculiarities are the use of a propylon entrance façade with a large dome immediately in the rear of it; the frequent use of outward slope or batter to the walls; and the combination of Saracenic general idea and style with some Hindû details. The most notable point is the propylon façade to the principal entrances, masking or partially masking a dome in the rear of it. The section through the north gateway of the Atala Masjid, of which we give a reduced reproduction from one of the plates in the book (fig. 1), gives an idea of the combination of dome and propylon, and shows the sloping sides and very Egyptian-like character of the latter. The general arrangement of the front elevation is such as we have indicated in the small sketch (fig. 2), consisting, as will be seen, of a square tower on each side with a screen wall under an arch between the two, and connected together by a horizontal cornice at the crown. In some instances, however, the angle towers rise a few feet above the cornice level and thus assert themselves more distinctly as towers, but always retaining the same arrangement below of a more or less ornamental screen-wall between the towers. The section given in fig. 1, however, though it shows the usual relative proportions of dome and propylon, does not represent the arrangement in the case of the principal

* "The Sharqî Architecture of Jaunpûr"; with notes on Zafarabad, Sahet-Mahet and other places in the north-western provinces and Oudh. By A. Führer, Ph.D., of the Archæological Survey. With drawings and architectural descriptions by E. W. Smith, architectural assistant. Edited by Jas. Burgess, LL.D., C.I.E. director-general of the Archæological Survey of India. Calcutta; Thacker, Spink, & Co.: Bombay; Thacker & Co.: London; Trübner & Co., and W. H. Allen & Co. 1889.

dome and centre propylon of the principal façade, as in this case the dome is always jammed close up against the rear of the propylon. If the reader imagines the intermediate portion between the propylon and the dome in fig. 1 removed, the propylon pushed back on to the dome, and the scale enlarged about one-third, it will then represent the proportionate arrangement of the principal dome and propylon in the same building and in others of its class. This rather peculiar and (we may add) very clumsy architectural combination, a large dome with a gate façade immediately against it which almost hides it from view externally, is the occasion of some speculation in the notes on the plates, in spite of what we are told in the preface as to the wholesome regulation forbidding the members of the Archæological Survey to "speculate." As the book is, "like Cerberus, three gentlemen at once," we do not know clearly to which of the three authors we are to credit the passage in question :—

"The special characteristic of the Jaunpûr style is the lofty propylon with sloping walls hiding a single dome, and it would be well to have some idea of the causes which led at this place to the adoption of this plan, so original, so quickly perfected and hardly imitated elsewhere.* Did we know, as we never can hope to know, which was called forth first, the dome or the propylon, we should be able to guess the object each was to answer. For while the dome is undoubtedly the most imposing covering for a single chamber, it seems, at least when seen from without, to overpower a room whose walls are not proportionately lofty, and it is hard to fancy how the effect of any building could be pleasing

Fig. 2.

when a dome covered the centre of a simple oblong. If, for the sake of an imposing internal roof to a central chamber, the founder wished to build a dome, and if with his desire to utilise material existing in abundance at hand, he was somewhat cramped in his choice of the height of his building, no great ingenuity would be wanted to make him think of proportionally elevating the central portion of his façade, turning his minarets, if he had planned any, into abutments, and filling the intervening arch with a rich screen which should conceal the dome. This seems the true theory. For the idea of the dome must surely have come first. The bold façade standing alone can have been satisfactory only when viewed directly in front; from every other point it would have seemed purposeless, from behind worse than purposeless. Yet, though it had been possible to view it only in the most advantageous way, from the direct front, few would dream of building a façade 75 ft. high and only 55 ft. wide at the base. And so we would claim for the Pâthan architects of Jaunpûr the honour of being the first in India to make domes and their adjuncts an imposing part of a range of buildings."

We have given this passage in full as the critical opinion of one of the producers of the book in regard to a peculiar point in the architecture illustrated; at the same time we think it presents a remarkable confirmation of the wisdom of the Indian Surveys Department in forbidding surveyors to "speculate." The result of this piece of speculation is the discovery of a kind of architectural mare's nest, a new combination in regard to which we only require to know whether the dome or the propylon came first, which, says the writer, "we never can know," though a few lines further down he says that the dome "must surely have come first." If he had considered what the plan has to tell him, he might have spared his conjectures, and we should have missed the above-quoted eloquent but hardly convincing passage. True that "few would dream of building a façade 75 ft. high and 55 ft. wide at the base," but the propylon is not a façade in the usual sense, it is a central feature to give dignity to the entrances, a grand gateway in fact. Take the reduced plan of the Atala Masjid (fig. 3); the pylons occur with about the same projection on each façade; where there is no dome, or only a small inner one, opposite the entrance, the dome and propylon do not interfere. On the west side, where it is desired to have a grand central apartment, the dome fills the whole width of the building, and consequently must abut against the propylon. There need be no question of which arose first; the propylon was the accepted form of gateway, the dome the accepted manner of roofing an important apartment; and when the apartment to be domed occupied the whole width of the plan, it had to be got in as best it could, crowding up on the propylon. It is true that in the Jâmi Masjid the smaller domes are crowded against the propylons as well as the larger ones. But this was one hundred years later, and only shows that, in this as in other cases in architectural history, a feature first brought about by accident or necessity got repeated and adopted by habit. But the origin of it was only a "fluke"; the two features have no architectural relation to each other, and are merely the result of a makeshift. The fine writing about it is therefore all thrown away.

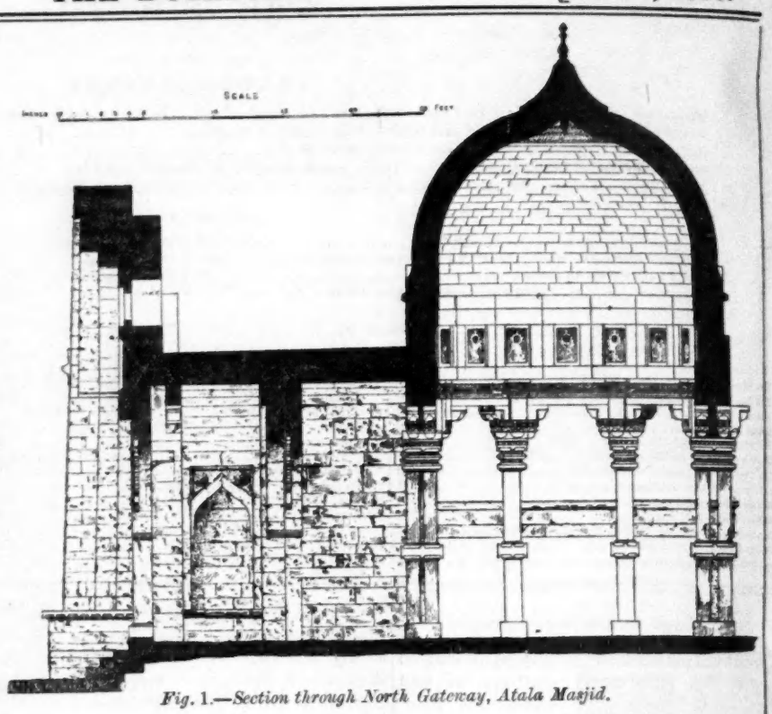


Fig. 1.—Section through North Gateway, Atala Masjid.

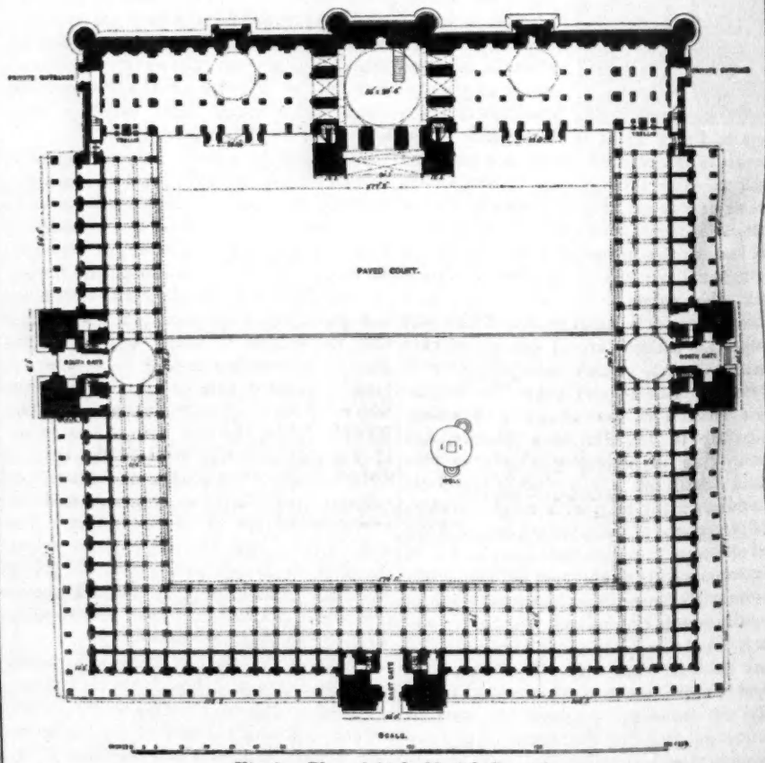


Fig. 3.—Plan of Atala Masjid, Jaunpûr.

* Fergusson gives a rather different impression: observing, "the peculiarities of this style are by no means confined to the capital. They prevail at Gazepore, and as far north as Canouge, while at Benares the examples are frequent."—*Indian and Eastern Architecture*, p. 525.

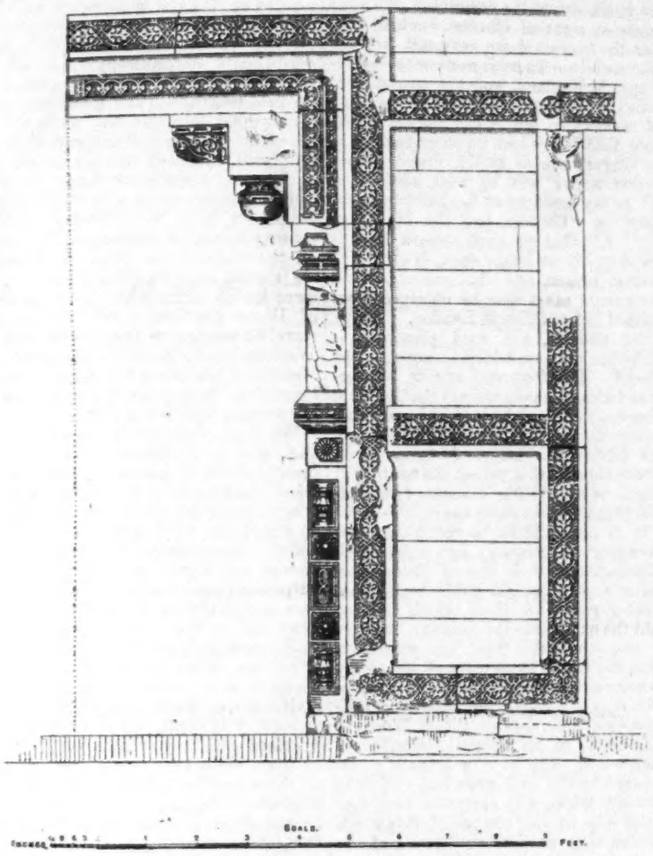


Fig. 4.—Principal doorway, Jâmi Masjid.

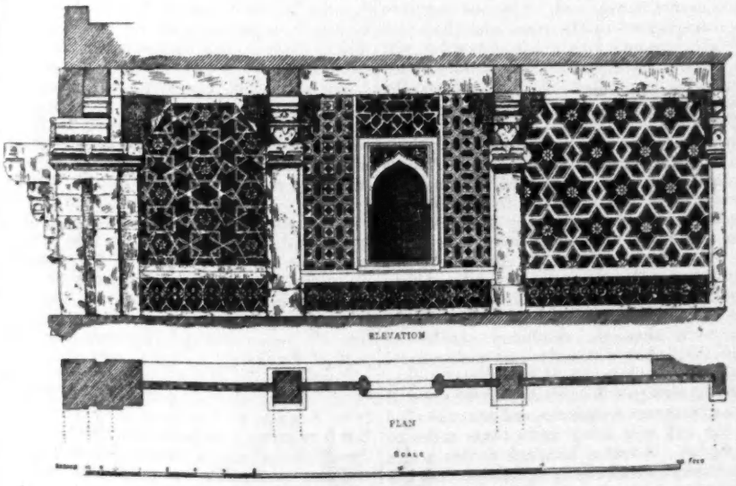


Fig. 5.—Screen-work, Atala Masjid.

Fig. 6.—Masons' Marks, Atala Masjid.

The resemblance of the plan of the surrounding colonnades to Hindû architecture, and the fact that no arches are employed, led Fergusson to half suspect at one time that this was a Buddhist monastery, with the domes and gatepieces inserted by the Mahommedan conqueror; an opinion positively entertained by some other less learned theorists. Fergusson was led on consideration to relinquish this idea, and to come to the conclusion that at all events the majority of the trabeated architecture in this and other mosques had been made at the time it was required for the places it now occupies. His suggestion that much of it was executed by Hindû converts to Mahommedanism, who could not shake off their old style and manner of working, receives additional confirmation in the present volume, especially in the inscription on the Lâl Darwâza Masjid, "Visadru's son Kamaû, the architect," which seems to settle the matter as to that building at any rate, and suggests every probability of the same cause producing the same result in other cases. The doorway of the central entrance to the Mosque, Jâmi Masjid* (fig. 4) is a curious mixture of Saracenic general feeling in the enrichments (though with an admixture of floral forms a little at variance with the pure faith) and Hindû detail in the pilasters and brackets. In some places the Saracenic pointed arch is found, foliated with growths of conventionalised lotus flowers; and in the pierced screen from the Atala Masjid (fig. 5) we see the mingling of Saracenic geometrical tracery with the flower-like ornaments beloved by the Hindû artist, especially in the delicate work in the lower range of ornament below the transverse bar. Among the large and interesting collection of masons' marks from Jaunpûr, which fill two plates of the book, we find the same mixture of geometric with more flowing and flower-like designs. We give (fig. 6) a small selection from these. One of them, it will be observed, is a purely natural leaf spray, two others are rude imitations of birds. Neither of these can be supposed to have been used by Saracenic masons.

Nothing perhaps is more striking in this group of buildings than the bold treatment of the outer walls of the Jâmi Masjid, of which a photograph of one angle is given (plate xlv.). The solid mass of the walls, thickening from the top to the bottom, relieved by occasional lines of delicate surface ornament and a very effective plinth moulding, and strengthened at the angles by the circular turrets also increased in diameter towards the base, combine in a remarkable degree an appearance of fortress-like strength with refined architectural expression. All the details of these buildings, except the diaper or superficial ornament, are however more or less clumsy and barbaric; such details as capitals and columns; and as to mouldings, they do not seem to exist, in our sense of the word; nothing but square sinkings; an infallible mark of architectural incompleteness of style and genius. Among the other buildings illustrated the Lâl Darwâza Masjid has considerable interest. It is described as constructed with stone and brick with cement, but principally of stone; externally as well as internally all the walls are of ashlar masonry neatly tooled with fine joints which are so beautifully worked that they hardly exceed a knife-blade in thickness. The writer sarcastically remarks that "churchwardens are the same all the world over," and that the stonework of part of the interior was not long ago treated to a coat of whitewash. He adds another caution which we hope will be attended to in future. Portions of the building, which is in a very dilapidated state, have been repaired, "but in such bad form that one almost wishes such restoration had not been attempted. Such work should clearly be conducted only by officers who have received a special training in architecture." Verily; but how many are there of such in the service? It is curious to observe that in reference to this building we are told that "from the evidence of the stones lying about, which have fallen in the lapse of time, it is evident that the stones of this, like all the other masjids of Jaunpûr, had been before used in Hindû or Buddhist buildings." We do not know whether the writer of these words is the same who says elsewhere in the volume that the Hindû element in the buildings is the result of the employment of Hindû workmen who were converts to Mahommedanism; but at any rate the two statements are quite contradictory.

The literary part of the volume, in fact, except the historical sketch, is the least valuable; and in future volumes it would be

* This, it should be explained, is the building hitherto known to students of architecture as the Jumma Musjid. In five years there will probably be another way of spelling it invented. Even in this book it is given in some places "Jâmi Masjid" and in others "Jâmi' Masjid."

better to cut the remarks down to the statement of actual facts, and leave theorising out of the question. But the collection of illustrations is of the highest value, and as we presume that the volume, though an official publication, can be purchased through the London publishers named on the title-page, we may recommend it to the attention of all students of architecture as a book worth possessing, containing some of the best illustrations of Indian architecture that have yet appeared. It is to be hoped that similar volumes, illustrating other branches of the architectural remains of India, will appear in due course.

THE NORTHERN EXTENSION OF THE METROPOLITAN RAILWAY.

THE extension of the Metropolitan Railway into the country is an interesting piece of railway enterprise. Speaking generally, the period of railway expansion in England has come to an end. The most important works of the present day consist rather in improvements of existing systems than in new and large enterprises. The Forth Bridge and the Severn Tunnel, for example, are simply, though very important works in themselves, improvements in railway systems which are already in existence. But the expansion of the Metropolitan Railway is not a mere improvement, it is the creation of a new system which will add another northern trunk line to the English railway system. When this new work is completed, it will always be regarded as a signal instance of what can be done by a railway magnate whose diplomatic powers are only equalled by his perseverance. The records of many half-yearly meetings of the Metropolitan Railway Company can be produced to show how Sir Edward Watkin, while in his own mind he had fully matured a large scheme of railway extension, was able to persuade his shareholders that he was only going to construct a few miles of line to the north of London for the purpose of feeding the metropolitan line within the metropolis. Now, however, the northern extension has for some time been opened to Chesham, and steady work is in progress on the portion of the system between Chalfont Junction (where the Chesham branch leaves the main line) and Aylesbury. At Aylesbury the Metropolitan unites with that miserable starveling, the Aylesbury and Buckingham railway. There are also intentions of uniting Oxford and London by this line. At the present time, therefore, it is an interesting trip to drive from Rickmansworth to Aylesbury, to see what manner of country it is through which the new line will pass, and to attempt to estimate the probabilities of the future. We take our start, then, from Rickmansworth, where at present the new line does not appear to have produced any kind of development. This is not surprising, for that little town—if town it can be called—which to George Elliot was a kind of permanent curiosity on account of its many public-houses, is handicapped by its situation. On the one side it is shut in by water-meadows which prevent its expansion, and on the other by Rickmansworth Park. It is equally clear, also, that the train service is not yet sufficiently quick to enable Rickmansworth to be the habitation of the clerk class. An excellent road starts from the Metropolitan station along the western brow of a valley of considerable beauty, through which the river Chess may be seen winding down to join the Colne. For a couple of miles Charleywood Common is skirted, where there is a station in a deep bottom, approached by dangerous roads. A few very good houses border the side of the high road, but, practically, the place is yet free from the builder. It is equally clear, however, that Charleywood has,—from a speculative builder's point of view, should property come into the market,—large future possibilities. But, on the other hand, it is equally clear that a considerable sum must be spent on making one or more roads across the common. We very soon come in sight of Chenies,—which it is well for the tourist, if we may call him so, to rest at awhile. There is not a more picturesque spot in England, and the church contains the chapel of the Russells, where most of that memorable family are buried. It is fortunate that it has had its story told by so great a literary master as Mr. Froude, since no inferior writer will be well advised to attempt to say again what he has told us in his essay on "Chenies and the House of Russell." All that we shall remark here is that the chapel is no longer open as of old to any passing person, and that orders to view the monuments must now be obtained from the Bedford Estate Office in London.

Leaving Chenies, the road presently is crossed by the railway, which is now on our right hand. Chalfont-road station is perceived, and almost a mile beyond the Chesham line branches to the right, and the main line bears away to the left towards Amersham and the Misbourne Valley. It keeps along the eastern side of this valley, the station at Amersham being a little distance from this quiet old place. Amersham has an old-world look. It is not difficult to recall the times when Waller, two centuries ago, represented it in Parliament. It is one of those long, broad streets, with an old gable here and a bit of sober red brick there, which take us back into the end of the last century, into the age of stage-coaches. The fine woodlands which thickly clothe large parts of the valley heights are much more noticeable here, more especially opposite Shardloes, where the railway passes on the verge of Pipers Wood, to which Cobbett, in his "Rural Rides," gives a passing word. The scenery is now somewhat marred by the enormous and unsightly embankment, which will carry the line over the grassy dip at the bottom of this wood. But in due time some of the beauty of the place may be regained by judicious planting, though the converging lines of wood and grass cannot be regained. The line begins to approach nearer to the road, and there are already signs up a lane of what some day will be Little Missenden Station. Before Great Missenden is reached, the line crosses the road, and takes the left or eastern side of the valley. It is in reality, however, running here almost in the bottom of the valley; here the line is in quite an elemental stage. Where it crosses the road the pier of the bridge is erected, but the concrete foundations of the other side are only being laid, and the line itself is nothing more than pieces of unjoined embankments. As we proceed along the road opposite to Missenden Abbey there is nothing to be seen of the line; it is lost behind the houses of Great Missenden, a village in character absolutely similar to Amersham, but distinctly less picturesque. Just at the upper end of the village a conspicuous sign-post informs us that we are still nine miles from Aylesbury, and that the road to the left will bring us in three miles to Hampden. About a hundred yards up this latter road the railway is again observed, but up the broad bit of valley beyond its future track is only marked by the wire fencing which indicates the land which will be taken for the purpose of the line. The wooded summits of the Chilterns around Hampden tempt us for a while from the direct route, and we are able, by a visit to Hampden Church and House, to picture to ourselves the country in which the patriot lived and died. It is as quiet and undisturbed a bit of England as can be found throughout the land, and no one who would clothe the dry bones of history with personal and local interest should neglect to visit Hampden's home.

We regain the bifurcation of these roads in due time, and trot onward to Wendover. The imperceptible rise of the valley has now brought us to the verge of the Chilterns, and on either side headlands of smooth grass rise and protrude into the vale beyond. We feel that almost insensibly we have reached the climax of the valley, which begins to rise from Uxbridge, and this is more apparent when the houses of Wendover are perceived nestled on the hill side below us. The railway will here have to pass through a cutting, and as we get beyond the little town the white chalk embankment which will carry it into the vale of Aylesbury pushes its unfinished length into the great vale plain, like a long quay into the sea. It is the last we see of the railway, for we proceed by a gentle and well executed descent more into the valley. A conspicuous house on the right reminds us we are now in the land of Rothschilds, for it is Mr. Alfred de Rothschild's country-house, at Halton, which stands just on the edge of the plain. If it were clear we should see Waddesdon Manor, in the direction of Bicester and Thame, the chateau of Baron Ferdinand, and most of us have travelled enough on the London and North-Western line to know that the great house of Mentmore lies some ten miles to our right, beyond the wide green pastures, over which the evening haze is hanging.

We have driven some twenty-two miles, and that is sufficient for the day. The county through which we have passed has many charms; it is naturally picturesque, it is as quiet as any part of England, and it has an air of the past about its villages and its secluded homesteads. It is clear that it is a district thoroughly in need of a railway for purposes of convenience,—of that there cannot be a possibility of doubt; but it is equally clear that it is a very naked land from the traffic manager's point of view. By no possibility can either the passenger or the goods traffic be large, and as soon as the line touches Aylesbury, it enters into competition with the two great systems, the London and North-Western and the Great-Western. It lies between these two; will it bear the squeeze of these two flourishing lines? The North-Western Company has already built a new station at Aylesbury, and will be able, it is obvious, to carry goods to or from Aylesbury at less cost than the new and struggling line. New and struggling it must be, for it is a line which only manages to pay three per cent. on its present capital, and to compete as a long-distance line much capital has yet to be expended. Baker-street Station must be converted into a large and roomy terminus, at a great expenditure of money. The line from Harrow to Baker-street must be doubled also, at a large cost, and considerable masses of new rolling-stock must be procured. Sir Edward Watkin's policy in "getting over" his shareholders was clever, but it may be doubted whether a bolder and franker line would not have really been best for the interests of the Company. To make a trunk line without a terminus must hamper its development for a long time, without any corresponding advantage. The line will be a useful and important one for a part of Buckinghamshire, a very poor agricultural county, but one well suited in the future for residential purposes, not too far from London to become thickly populated. But it requires a sanguine mind to believe in the extension being a financial success, so far, at least, as regards the portion of it from Rickmansworth to Buckingham. A poor but picturesque agricultural county is not likely, in this generation, to feed a new line richly, nor can the fine pastures and hayfields between Aylesbury and Buckingham, served as they will be by these lines, be considered a hopeful district.

BATH.—In reference to the Bath School Board competition, several architects of Bath have forwarded a letter to the Bath School Board calling attention to certain conditions which are now recognised in the profession for conducting public competitions. 1st, That the architect whose plan is selected shall be employed to carry out the work at the usual charges. 2nd, That certain premiums shall be offered to two or three at least of the non-successful competitors. 3rd, That a qualified professional assessor be appointed to adjudicate on the plans, and his award to be final. 4th, That the plans not adopted shall be returned to their authors. The letter was considered in a very respectful manner at the School Board meeting, and further procedure in the matter was adjourned for the fuller consideration of the suggestions comprised in the communication.

NOTES.

A PRACTICAL demonstration of the process of cremation as applied to the destruction of animal remains was witnessed at the Crematorium at St. John's, Woking, on Saturday afternoon last, by the Association of Public Sanitary Inspectors of Great Britain, on the invitation of Mr. J. C. Swinburne-Hanham, the Honorary Secretary of the Cremation Society of England. About eighty members of the Association were present, and they were accompanied by Sir Spencer Wells, Dr. Richardson, Captain James, Mr. Swinburne-Hanham, Dr. Tripe, Mr. Perry F. Nursey, Mr. Hugh Alexander, and other gentlemen well known in medical, sanitary, and engineering circles. The body of a ram was cremated on this occasion. The weight of the carcase was stated to be about 200 lb., and the time occupied in the operation was an hour and a half,—this being thirty or forty minutes more than are required for the cremation of an adult human body. The explanation of this delay was, firstly, that the carcase of the ram was considerably heavier than the corpse of an average adult; and, secondly, that the process of combustion was considerably retarded by the fact that nearly all of the eighty or ninety visitors availed themselves of the opportunities afforded by the eight or ten "peep-holes" in the sides of the furnace to watch the process of combustion, which was consequently delayed by the inrush of cold air at the apertures in question. In the case of the cremation of a human body, this delay could not take place, as it is the regulation that only one person representative of the family of the deceased can be admitted to the cremation-chamber, and, as a rule, only the furnace-man would use the "peep-holes," and only towards the end of the period usually required for the operation, as the representative of the deceased would usually be content with seeing the body deposited in the furnace and waiting until the ashes, in the form chiefly of calcined bone, were withdrawn at the conclusion of the operation. Saturday's demonstration was regarded by all the visitors as completely successful. There was nothing repulsive about it, and no effluvia of any kind were given off. On previous occasions we have sufficiently described the construction of crematoria. The two at Woking are on the Gorini system. We say "the two," because in addition to the one used for the demonstration on Saturday last, the Duke of Bedford has had a crematorium built for himself closely adjoining, and it is possible that a cluster of four, five, or six will ultimately be built,—all of them, it should be mentioned, being served by one chimney-shaft. At the base of the shaft with which the two crematoria are already connected is a purifying muffle-furnace kept at a very high temperature, through which the gases from the furnaces are made to pass so as to eliminate from them all noxious effluvia before they escape into the atmosphere. The buildings at Woking include a funeral chapel, and a waiting-room for mourners. While the cremation of the ram was in progress, a few speeches were made in the chapel, Sir Spencer Wells expressing his regret at the absence of Sir Henry Thompson, the President of the Cremation Society of England. Dr. Richardson and Captain James (Chairman of the Sanitary Committee of the London County Council) both expressed it as their decided opinion that for large towns cremation was becoming every day more and more necessary on sanitary grounds. Captain James especially referred to the dreadfully overcrowded condition of many of the London cemeteries,—some of them now completely surrounded by densely-populated neighbourhoods. Mr. Hanham stated that cremation seemed now to be making rapid progress in popularity. The Crematorium at Woking had been established thirteen years, but, although up to the end of last year only 100 human bodies had been cremated, this year, so far as it had gone, thirty-eight human bodies had been cremated there; and crematoria were being erected, or were projected, in such important centres of population as Leicester, Glasgow, and Manchester.

THE correspondence in the *Times* on the shortcomings of railway companies is still going on, numerous complaints having been lodged; while some of the letters have been of quite a different tenour, and if written in respect of any other business, might have proved invaluable as testimonials. To our mind, however, the most formidable of the many indictments falls into insignificance in the face of a letter which appeared in the *Globe* of the 1st inst. It is dated from the Temple, and the writer states that he travelled from Gloucester by the Great Western Railway on Monday, and that shortly after leaving Swindon it became apparent that something was seriously wrong with the carriage in which he was seated. He thereupon pulled the communication-cord right into the window, but without any result. After jolting along in a most alarming manner for two or three miles, the train was stopped,—but only through the driver of a train going in the opposite direction calling attention to the mishap by whistling,—when it was found that an axle was broken and the carriage was off the metals. The writer examined the cord, and found that on the driver's side a large knot prevented it from passing over the pulley-wheels, while on the other side it had broken! This certainly appears a most scandalous case, and it is quite clear that the communication-cords are often worse than useless. The law is evidently inefficient in simply compelling the companies to provide means of communication, unless it can enforce their being kept in working order.

THE practice of the Great Eastern Railway Company of issuing packets of tickets, available for a week, should be followed by all other Companies. But the tickets should not be confined to third class only, and there is no reason why the tickets should be used within a week from the day on which the packet was issued. More especially should this system be taken up by the Underground Railway Companies. A decorator at Kensington may have a piece of work at Bayswater, which will require his attention for a week. It would be a great convenience if he could take a packet of tickets which would enable him to travel backwards and forwards for one week without having daily to take fresh tickets. The issue of such packets at a small reduction is not only a convenience to passengers, it also increases the traffic of the line, and eases the press of work at the booking-offices. The astonishing thing is that this and many other small improvements have not been long ago taken in hand by the Metropolitan and District Companies, who can never compete effectually against the Omnibus Companies unless they attend to many details which are now unheeded.

IF the movement against "tied" public-houses becomes general, it is likely to have some important consequences in regard to the value of house property. For it is obvious that if magistrates refuse licences to the tenants of "tied" public-houses, who are notoriously simply the servants of the brewers, it will be necessary for the brewers to put a good deal of house property in the market. It is too soon yet to be able with certainty to assume that the movement will be general, but there is every appearance of its becoming so, and it is certain that the licensing laws intended that the licensee of a public-house should be the responsible tenant of the house. If the property is put in the market, it is clear that a good deal of it will be depreciated in value, and that many new or proposed buildings, which speculators are hoping may be taken up as public-houses, will not find buyers, as there will be so much public-house property in the market. It is equally clear, also, that as the ordinary licensee can in many cases not take up a public-house from lack of funds, an impetus will be given to the operations of loan companies and similar institutions, who will have to lend the money to the would-be tenant in order to enable him to buy or fit up the house.

THE latest number of the American "Journal of Archæology" (vol. vi., Nos. 1 and 2), has a good article by Mr. George B. Hussey, of the American School of Classical Studies at Athens, on a subject of considerable interest. Everyone knows the custom that prevailed in antiquity of rewarding public benefactors with a crown, and most people are aware that it was also the custom at certain periods to reproduce these crowns on the grave reliefs and on monuments connected with the recipients. No systematic treatise on the subject of these crowns has appeared since Paschalius, of Leyden (A.D. 1625) wrote his pamphlet "de Coronis." Mr. Hussey's monograph is illustrated by two plates, showing the various, shapes, positions, and inscriptions of these honorary crowns at different dates. We can only state here his main conclusions:—1. In regard to form, it has been shown that the *pendent* crown only belongs to the better periods of Greek art, the *erect* crown, on stone monuments at least, appears first in the time of Trajan or Hadrian. A peculiar ray-like arrangement of leaves is found to indicate a crown of gold. 2. As regards inscriptions, these consist of one, two, or even three terms, placed regularly in the order of giver, cause of the gift, and recipient. A tendency to enlarge and crowd the letters is noticed in the later reliefs. Instances where some of the terms are found outside the crown belong mostly to the second or first century before our era. 3. In the arrangement of crowns on the monuments two positions—extreme left hand or middle—are found to give special emphasis to the crowns so placed.

IN a letter to the *Times* Mr. Poynter draws attention to the slow but sure destruction of the remains of Karnac, owing to the eating away of the bases of the great columns by the mineral salts in the soil. He mentions Marritte Bey's opinion that if left to itself, the entire ruin of the temple must be only a question of time. Surely some efficient measures should be taken, without further delay, towards the preservation of all the remains still left of this wonderful monument of the most ancient known architectural style of the world.

IN the present number we publish reproductions of two fine sepia drawings by Mr. A. Graham showing the existing remains of the Roman arch at Timegad in Algeria, and his restoration of the arch based on those remains. The latter drawing, showing the restoration of the arch, was exhibited in the Royal Academy architectural room this year. In commenting upon it, we expressed surprise that a restoration should have been shown without any drawing of the actual remains on which the restoration was based. It appears that Mr. Graham did send such a drawing, which we have the pleasure of publishing this week, but that the wisdom of the Hanging Committee of the Academy rejected it! This is a new example of the utterly careless and incompetent manner in which the hanging of architectural drawings at the Academy appears to be carried out. An R.A. architect is generally *nominally* responsible for the hanging of this class of exhibits; how much does he really see to it? In a French exhibition it would be considered the height of absurdity to hang a restoration of an ancient building without a drawing of the "état actuel," and if we consider what some few of the drawings were like which were hung, the refusal of this necessary complement to the Timegad restoration drawing, in the shape of a really good and artistic drawing of the actual remains, becomes the more absurd.

WE are glad to receive from Mr. Batsford, the well-known architectural publisher, an announcement of the appearance shortly of the illustrated work which Mr. J. A. Gotch has for some time had in preparation on "The Architecture of the Renaissance in England." The work will be issued in parts at intervals of two or three months, the first part being promised during the present month. All architectural students will look forward with interest to the appearance of a work on so fascinating a subject, by an architect who combines the artistic with the literary faculty in no ordinary degree. Mr. Gotch is assisted in the work by Mr. W. Talbot Brown, A.R.I.B.A. The book will illustrate such essentially English buildings as Hardwick Hall, Hatfield, Kirby, Burghley, Cobham, Blickling, and many others of lesser note. The larger illustrations will be produced by the phototype process, and will comprise general views of the buildings both exterior and interior, with special features to a larger scale, and the text will be interspersed with about a hundred small sketches of other interesting features, such as balustrades, dormer windows, corbels, bosses, &c.

THE project to commemorate, next year, the hundredth anniversary of John Wesley's death (March 2, 1791), has assumed a definite shape. It is proposed to convert his house, near to the Chapel in the City-road, into a museum of relics and curiosities relating to the history of Methodism, to restore the chapel, repair the burial-ground, and to erect a new monument to Wesley there. Wesley laid the foundation stone of the chapel, on a parcel of ground leased by the Corporation, near Bunhill-fields, in 1777; he occupied the house close by, and was buried in an adjoining vault, which he had prepared for himself and for itinerant preachers who should chance to die in London. In 1740 he, with his own followers, left Whitefield, and the tabernacle in Moorfields, commonly styled as "The Foundry," for this site in what was then known as Royal-row. "The Foundry" has been twice rebuilt since. Amongst other buildings in London that are associated with the career of the founder of the Methodists may be cited the meeting-house at Bromley-by-Bow; Count Zinzendorf's Moravian Chapel in Fetter-lane; Lambeth Chapel, opposite to Bethlehem Hospital; and the Wesleyan Chapel in Justice-walk, Chelsea. He preached in the last two named, upon two successive days, within a fortnight of his death.

WE are informed that special efforts have been made to render the Architectural Association soirée, announced for Friday evening this week at the Westminster Town Hall, superior to any of its predecessors in attractiveness. The large hall was to be converted into a large drawing-room hung with decorations, and the whole of the rooms lighted for the occasion with electric light. It would have been better if this information had been given us at an earlier date, but we hope this mention of it may be seen by a good many of our readers before the time appointed for the entertainment.

THE *English Illustrated Magazine* contains an article by Mr. Austin Dobson on "'The Vicar of Wakefield' and its Illustrators," a subject of considerable interest. Examples of cuts from various illustrated editions are given, some by names little known at present; one by Bewick, one by Stothard, and some outrageous examples from Rowlandson and Cruikshank, neither of whom were worthy to touch Goldsmith's work as illustrators. As Mr. Dobson does not confine himself to prints published in the book, but includes separate illustrative works, such as Stothard's water-colour at South Kensington, it is odd that he should have omitted all mention of two important paintings, among the best illustrations of scenes in "The Vicar" that have ever been painted, and which were both exhibited at different times in the Burlington House "Old Masters" Exhibitions. One of these, exhibited a good many years ago, was by Newton, and represented the return of Olivia to her family; we remember calling special attention to it at the time, and suggesting a doubt whether there was any painter of the present generation who could have equalled the pathos and delicate perception of character shown in this work, though many might surpass it in technique. The other painting referred to is by the elder Leslie, the father of the present well-known R.A., and occupied a prominent place in the first room at last year's loan exhibition. It represents the scene which provoked Mr. Burchell's famous monosyllabic criticism, "Fudge!" and in it the various characters of the story are realised with a truth and discrimination which we have rarely seen equalled in an illustrative painting of this class; they are the very people as Goldsmith described them. To omit all mention of this work, so recently exhibited in London, in an article on the illustrators of "The Vicar," is an extraordinary oversight.

THE descriptive notices of buildings illustrated in our pages are, naturally, in most cases furnished by the architects of the buildings, who usually and quite properly add the names of the contractors who carried out the work, but unfortunately in many cases do not take the trouble to be accurate in these details. This complaint arrived at (we hope) its climax last week, when we received letters from contractors engaged on three different buildings illustrated, complaining that their names or those of their firms, or what archæologists call their *provenance*, had been wrongly given. In the description of Bablake schools, "Messrs. Thomas & Sons" should have been "Thomas Lowe & Sons"; in that of Armagh Cathedral restoration "Mr. Bowater" should have been "Mr. Bowdler," and another contractor "of Belfast" should have been "of Portadown" (in this latter case the contractor's name is so illegibly written both by the architect and the correspondent who writes to correct it that we prefer to leave it out); and in the description of Hatchford "Mr. J. Boulting" should have been "Mr. Thos. Boulting." Now, every one of these mistakes are due *to the architects who furnished the descriptions*, upon whom we are absolutely dependent for such information. One of them was a case of illegible writing, the others were deliberately and clearly written the wrong way in the architect's "copy." We call the attention of architects to this because mistakes of this kind cause a good deal of annoyance and even injury to the tradesmen whose names are given wrong, and a great deal of trouble to us. An architect *must* know the correct name of a firm that has been doing work under him; surely he might take the trouble to write it correctly and legibly.

LETTER FROM PARIS.

THERE is not much news at this time of the year that is of architectural or artistic interest. Exhibitions are closed, Parliament in vacation, and the public works in progress mostly partake in the general slackness of the period. Among these latter however may be mentioned with approval the new cut that is to be made into one of the densest and ugliest quarters of Paris by the opening of a new section of the Avenue de la République. In a few days will commence the demolition of the houses between Rue Oberkampf and Rue St. Maur, and the stacks of wretched artisans' dwellings will disappear and their inmates be driven to cheaper quarters in the suburbs. When this long avenue is entirely finished, in about eighteen months, it will form an unbroken communication between the Place de la République and the Faubourg Belleville. A rope tramway is also in hand on the same line of road. These improvements will considerably modify a quarter of Paris which stood in much need of improvement.

Among the new works going on in the eastern quarter of Paris is the enlargement of the Gare de Lyon, on which a large sum is being expended. One feature in this work is the construction of a steel viaduct carried obliquely over the Boulevard de Bercy and which permits of a division of the traffic from the main line, which it will rejoin in the neighbourhood of Villeneuve St. Georges. This will relieve the pressure of traffic and the delays caused by the frequent crowding of trains at this point.

We may mention in passing a very useless and even dangerous piece of work which has been permitted in the Boulevard St. Marcel, an excavation namely, with the object, it is said, of discovering the remains of Mirabeau originally deposited in the Panthéon! It is matter of complaint with the inhabitants of this quarter that the Administration should have permitted this stirring up of ground which is saturated with human remains; a proceeding quite inconsistent with the regulations which the Municipality is endeavouring in other places to enforce in the interests of sanitation. It is with this object that the mortuary dépôts, now nearly completed, in the cemeteries of Père La Chaise and Montmartre, have been carried out, in order to avoid the necessity of keeping bodies, after dissolution, in the crowded houses of the poorer classes. These mortuaries, designed by M. Formigé, are built in a very simple style and partly masked by shrubs and flower-beds. That at Montmartre will be opened for use on November 1.

In the same cemetery and at the same time will be inaugurated the graceful monument to the painter Guillaumet, designed by M. Ernest Barrias, sculptor. A model of it in wax was exhibited at the last Salon, under the title "Jeune fille de Bou-Saada." It is now being cast at the founders. It represents a young African girl seated and throwing flowers on the tomb of the Orientalist painter, whose portrait appears in bronze on a medallion, while the titles of his principal works appear engraved on the granite pedestal along with the simple inscription "Gustave Guillaumet: 1840-1887." The inauguration of the monument to Delacroix is fixed for October 5. The sculptures have been fixed in position and the decorative effect of the whole can now be judged of. The bust of the painter is admirable in truth of expression. It is placed on a pyramid of white marble in front of which is the fine group in bronze, "à cire perdue," of which we have before spoken, and which, like the bust, represents the best of work of M. Dalou. The whole is in the centre of a small hemicycle in marble, in the avenue of plane-trees which runs by the side of the Luxembourg.

Although not a Parisian monument, we may say a word as to that to Garibaldi which is in course of execution by the sculptor, M. Deloye, and is to be set up at Nice in June 1891: a monument which has already undergone sundry vicissitudes. It was the subject of a public competition in which Antoine Etex obtained the prize. At the death of this aged artist, the Municipality of Nice, after much hesitation, addressed itself to M. Deloye, who found himself embarrassed with numerous difficulties, partly of a political nature, but who has at last completed his model. The statue of the Italian patriot, in white marble, will stand on a stone pedestal, in his well-known and traditional costume which lends itself so well to sculpture: large boots, and mantle flying in the wind: the right hand rests on the hilt of his sword. Before the pedestal is an allegorical group representing France and Italy clasping hands over the cradle of Garibaldi. The whole will be completed by a bas-relief in bronze representing the "Rendezvous des Nations" at Nice.

There is also to be mentioned among recent artistic works a fine medallion portrait which has been put up in the Church of St. Louis, in the Isle of France, of the last curé of that parish, the Abbé Bossuet, great-nephew of the celebrated Catholic orator, and who devoted all his fortune to beautifying his church. The medallion is the work of M. Coutan. It is surmounted with the arms of the Bossuet family and surrounded by a little architectural framework designed by M. Charles Normand.

The projected French Exhibition at Moscow is already the object of much preparation. Among the committee of organisation is M. Alphand. M. de Dramard has been named the delegate for the artistic department on the committee.

Various journals have announced that the *Encyclopédie d'Architecture* is about to establish an annual competition which will offer a certain interest and stimulate the originality of young architects. The object of the competition is to

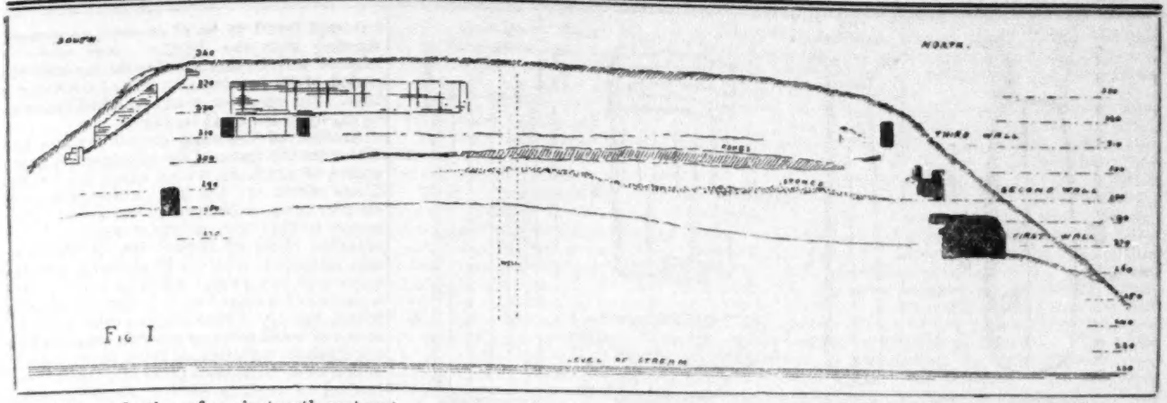


Fig 1

aim at the production of a nineteenth-century style. The result will show whether the idea is any more than simply Utopian. All kinds of designs, from a public building to a shop, will be admitted, and are to be sent in by the fifteenth of November to the office of the *Encyclopédie d'Architecture*. Prizes in money will be given to the designs selected as the best, which will be published in the *Encyclopédie*. A certain number of eminent architects, such as MM. Bailly, de Baudot, Charles Garnier, Lisch, Moyaux, Vaudremer, &c., have accepted the office of examiners of the drawings sent in.

The "Société Française des habitations à bon marché" has opened a competition of another and more practical kind, for the best study for artisans' dwellings. This new competition will be closed on November 15.

At the École des Beaux-Arts the candidates for the Jauvain d'Attainville prize (historical and landscape painting) have just finished their work. The subject for landscape is a shepherd collecting his flock at sunset; that for history, the decoration of a hall with pictures representing Agriculture and Commerce. The decision on these will be given at the end of the month. The classification of pupils for the competitions of the year is as follows:—"Grande médaille d'émulation," M. Bonis, for painting; M. Miserey, for sculpture; M. Chifflot, for architecture; Abel Blouet prize (architecture), M. Louvet; Jay prize (architecture), M. Tavernier; Jean Leclaire prize (architecture), MM. Chifflot, Jaboulay, and Delassus.

In administrative quarters the question of the admission of women to the course of the École des Beaux-Arts is still under discussion, and is considered to present serious difficulties. Women have already been admitted to the Sorbonne course of study, to that of the École de Droit, and that of the Faculté de Médecine; but it is considered by some that the studies of the École des Beaux-Arts stand on a somewhat different footing in this respect to the more grave and serious studies of the institutions above named. Moreover the students of the École, under pretence of keeping up the classic "Bohemian" traditions, affect too often an exaggerated liberty of speech, dress, and manner, and eccentricities "peu convenables," it is maintained, for feminine association. The Minister of Public Instruction, M. Bourgeois, is said to be in favour of the change, of which Madame Léon Bertaux, president of the "Union des Femmes Peintres et Sculpteurs,"* is the persevering and eloquent advocate. Nevertheless, there are many who consider that it would be a very questionable expedient, as regards "les convenances," to authorise the joint use by both sexes of the ateliers, as they are at present conducted, and that parents and relations on the ladies' side would probably set their faces against it.

If this is the final conclusion, it would be necessary to establish ateliers for women, in other words to enlarge the establishment altogether, to open new galleries, and proceed in fact to a completely new and costly installation of the whole machinery of the École in duplicate. It would then become a financial question, which the Chambers alone can settle. Nevertheless, M. Bourgeois is so strongly in favour of giving women equal advantages of artistic instruction with men, that in one way or the other it will probably be accomplished.

We have to record the death of one distinguished lady artist, Mdlle. Louise Lalande, well known by her contributions to the Salons, and who has died at Paris at the age of fifty-six.

* "Sculpteuses" would seem more correct.—Ed.

MR. FLINDERS PETRIE'S DISCOVERIES IN EGYPT.

Last week we laid before our readers a notice of the discoveries made by Mr. Petrie in the Holy Land where, for the first time, an effort has been made to penetrate into one of the mysterious mounds so common in the country. In continuation, we are now able to publish a section (fig. 1) showing the general formation of the "Tel" which, as we then stated, is most probably the site of the ancient stronghold, Lachish. The diagram, by Mr. Petrie's courtesy, is sketched from the measured drawing prepared to a large scale, and which shows the results of the excavations. Since this drawing has been prepared for publication we have ventured in fairness only to anticipate and not to supersede it by the sketch which we now furnish, which is not to scale, and which will not render the more elaborate drawing unnecessary when published.

It shows at a glance the positions of the successive walls, and of various buildings erected one above another.

The lower construction of the two nearest to the south side is that which contains the slabs of limestone with spiral volutes forming the jamb linings of its doorways, of which there

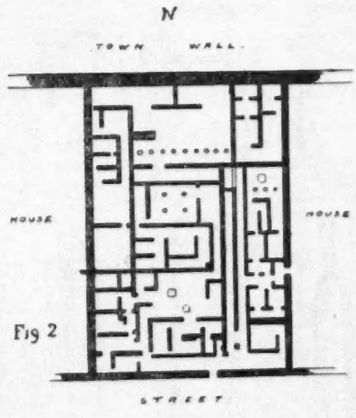


Fig 2

are two in each of three of its quadrangular sides. The long building above it, of a different age, shows us the pilasters already mentioned.

Its axis is different to that of the building below it, and the interval of time between its erection and that of the abandonment of the lower fabric, must have been of sufficient length to allow not only of the gradual raising of the mound, but of its consolidation sufficiently to admit of the erection of the massive structure now found above it. The small amount of earth that has been excavated, and the large amount of work still remaining for the discoverer, is abundantly shown by the little diagram.

We turn to the Egyptian discoveries which Mr. Petrie has accomplished. In treating these briefly and in the second place, as we do, we are in no way unmindful of their importance in relation to the many items of ancient history, ethnology, and artistic beauty which they render. We do so only by reason of the new page of the history of the Holy Land, which the discoveries at Lachish unfold to us, while those in Egypt are the continuation of the researches of last year.

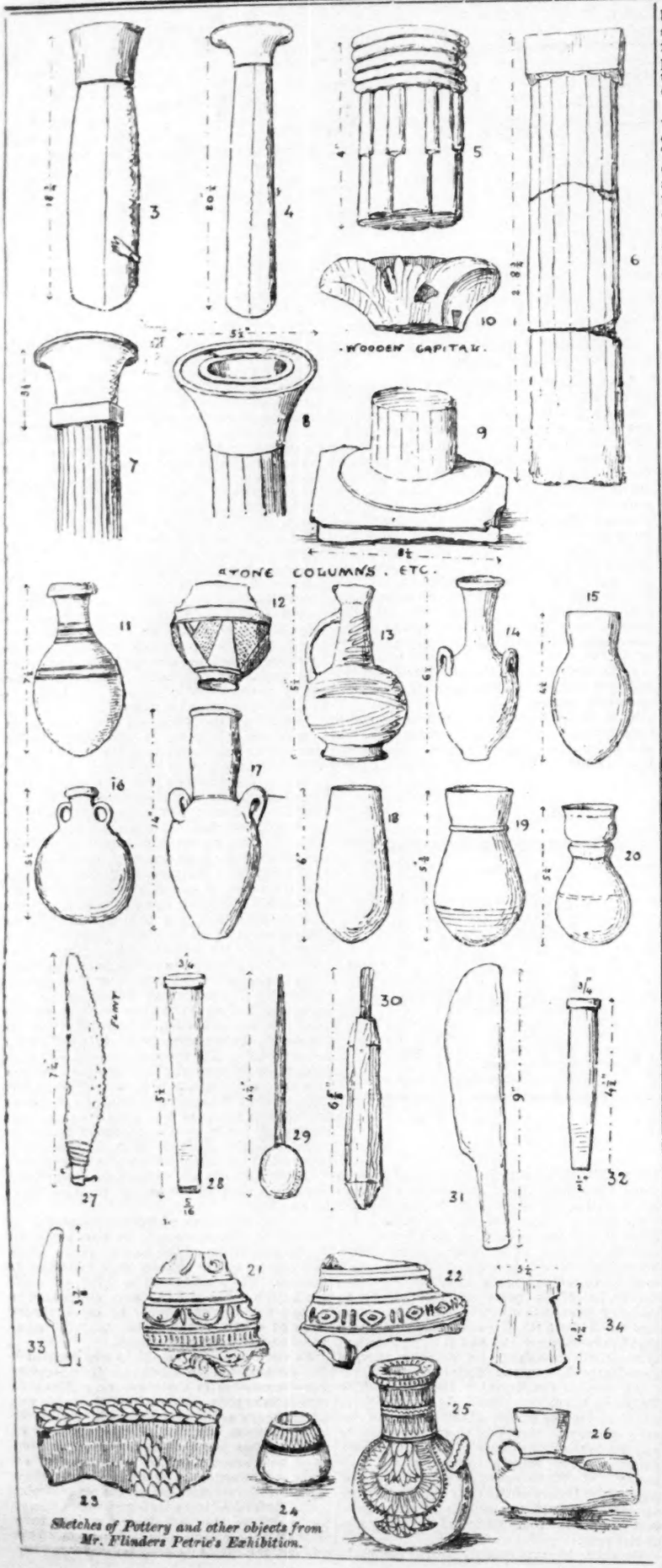
Mr. Petrie has now entirely cleared the whole area of the town of Kahun, which, it will be remembered, is situated on the borders of the Fayûm, Upper Egypt, and formed, as he supposes, during the XII. Dynasty by a colony of workmen engaged in the erection of the Memorial Temple and Pyramid of Usertesen II., and deserted when the work was completed. The plan prepared during the progress of excavation indicates what was the form of an Egyptian town at the period of remote antiquity stated, according to Bunsen's chronology, about 2,600 years B.C. It is in form a parallelogram, the two longest sides facing north and south, and closed within a massive wall, constructed, like the houses, of sun-dried brick. The houses to the north, in the more important part, abut upon the town wall, and are divided into parallelograms of varying size. Those to the south abut upon a street. Two streets run east and west, connected by another at right angles. Close up to the west wall others perhaps existed, but the site being furrowed by the passage of rain-water, which has washed away a considerable portion, can hardly be accurately examined in this respect.

Adjoining the town on the west is an annexe which appears to have been inhabited entirely by workmen. Judging by the way it joins on to the plan of the other portion of the town, we consider that it is of somewhat later date, an addition to the previous work, and this belief is supported by the fact that its south-west angle touches that of the temple enclosure, thus blocking up the separating space which appears to have been previously opened.

We publish a diagram (fig. 2), sketched from the town plan, of one of the principal houses, which will give a fair idea of the whole. Here, for the first time, may be seen what was the arrangement of an important household at a period which is anterior to the usually accepted date of the Flood if we accept Bunsen's chronology; or some few centuries later if we accept Wilkinson's. The curious arrangement of the passages leading to various portions of the mansion are, doubtless, intended for the use either of different sexes or of different grades of occupants. The open courtyards, with their pillars for the support of surrounding coverings, are prominent features of the arrangement, and remind us of the similar planning of the Greek and Roman houses of long posterior date. The workmen's houses were approached from various narrow streets running from the eastward up to the western wall of the town, where they stopped, being thus *culs de sac*. They were of small size, crowded close together, and at right-angles to one another.

The enormous mass of work accomplished on this site by Mr. Petrie may be best estimated by his calculation of the various rooms which the whole of the houses were estimated to contain. These amounted to 2,738, of which the large number of 2,145 were cleared out in a most painstaking manner by our explorer's body of workmen, one by one, and the excavated earth carefully examined.

As the earth from one room was removed it was thrown back into another. By this means no accumulation of earth was ever allowed to remain to impede progress, and the work was all the more easily accomplished. The result of the system adopted was the discovery of many curious items of arrangement, as well as of an enormous number of articles of all kinds and descriptions. One of the most curious is that of the common use of the semi-circular arch. Several cellars were found, which, except where cut in the rock, were found to have arches formed of two rings of headers. This was not the case in merely isolated examples,



Sketches of Pottery and other objects from Mr. Flinders Petrie's Exhibition.

but was found to be of constant occurrence, showing that the builders were perfectly familiar with its use, and thus setting back the period of its invention to some long anterior time. The specimen brick exhibited measures 6¾ in., by 3¼ in., by 1¼ in. thick.

Another of the most curious features met with were the traces of the columns to the open courts, of which fig. 6 is an example, of stone. These stood on the flat, widely-projecting, circular bases, so common in later work. They appear to have been mostly of wood, so far as regarded those of largest size. A portion of one, octagonal in plan, still existed *in situ*, the upper part being burnt, while in another place a portion of a carved capital, also of wood, was found, fig. 10. There are, however, many remains of small columns of stone, some of which approach an early form of Doric, having slightly hollow or straight-lined flutes, and square blocks instead of capitals, similar to the so-called Doric pillars of the Beni-Hassan tombs. A great many fragments of small, pedestal-like shafts were found, which prove to be hollowed on top, either for the reception of offerings or for the support of lamps.

Figs. 3, 4, 5, 7, and 8, are typical examples of these curious articles of decoration. No. 5 is a capital of a more ornamented shaft, worked like the others, somewhat irregularly, as if the mason had trusted to his eye for his lines. No. 9 is the base of one of these small shafts, imitated from a structural column of larger dimensions.

This being a town of building artificers, our readers will be interested in the sketches of some of the tools used by the workmen of the remote period under consideration. Flint implements are found in great profusion, side by side with others of copper, the principal being cut flint knives (of which fig. 27 is an example), chisels, and scrapers.

Of the copper tools, figs. 28 and 32 are chisels, circular above, flat at the edge—all fair examples. Fig. 29 is a borer, and fig. 30, similar to a modern bradawl, is still contained in its wooden handle. Figs. 31 and 33 are copper knives, of which a large number of all sizes were met with; and 34 is an adze, one of which was found tied with thread to bind it to a handle, similar to the flint knife, fig. 27; but in this case the thread was further secured by a seal.

Some of the houses had evidently been decorated in colour, and a portion of wall painting is exhibited. This shows a subdued red ground lined out with two narrow bands of white separating a broader one of fawn colour from a jet black border.

Traces of occupation, later than the twelfth dynasty, were found; and this points to the possibility of the town having had some separate existence from the sanctuary adjoining it, which we think may have been the case, since the area is so much larger than what any mere band of workmen and their overseers would have required. The better portion of the town is, in fact, of much larger area than that specially devoted to the workmen. One of the papyri found, indeed, affords confirmation of the existence of the town at least into the period of the thirteenth dynasty, since we may fairly accept the town named (Kherp Usertesen) as being the Kahun of to-day. It gives a list of the workmen on the wall of the town, the entries being dated, as rendered by Mr. Petrie, the first, second, and sixth years of Sebekhotep I. Our purpose is but to treat of the more architectural and artistic of the relics found, and reference to the beautiful seals, necklaces, and such-like matters, of which there is abundance, may be omitted as being apart from our object. Still, we are bound to mention, as an example of artistic work, an admirably written papyrus, a hymn to Usertesen III., in which all benefits conferred by Deity are ascribed to him. The writing is beautiful and regular, and in fine general condition, notwithstanding its remote antiquity.

The continuance of occupation of the town, however, does not appear to have been general, for at a later period the vaults of some of the houses were found to be used for burial purposes, and, apparently, at varying periods.

Excavations were also carried on again at Gurob, a site which had been previously investigated by Mr. Petrie, a site of more than a thousand years of later date. Here articles of great beauty and of varying races were found, including many works of greater elegance and finish than the earlier ones from Kahun.

Here was met with a fine lion's head, evi-

dently intended to be used as an architectural decoration, an admirable study for a sculptor, since it is worked to be seen from some little distance, and not a single detail is rendered more than was necessary for proper effect. The implements found are of bronze, instead of copper, and some of the articles, particularly the handle of a mirror worked with the Phœnician Venus with a dove, are very admirably designed and executed. A number of frits, as originally manufactured, used in glazing pottery, and to be ground up as paints, were also found. These are deep blue, the beautiful turquoise green, pistoline iron ore, and hæmatite, ground up to form red paint, and many others.

Beside these is a case, with examples for comparison which have been prepared by Dr. W. J. Russell, F.R.S., in imitation of the ancient colours, made of copper salts, and the resemblance is remarkable.

The pottery from the two sites forms a special feature in the exhibition, and, since the existence of Egyptian pottery as a distinctive class has not been in proof for very many years, the present collection forms an admirable opportunity for the comparison of very early and later specimens, together with examples of foreign manufacture imported by the Phœnicians. In addition, there are some few specimens called Ægean, by Mr. Petrie, of which we illustrate a fragment of curious black ware, fig. 12, the lines of which are filled in with white, similar to examples still made along the borders of the Dead Sea. Another, fig. 13, has white lines on a reddish ground, and fig. 16 is a reddish ware, Askos.

Of purely Egyptian forms, figs. 11, 14, 15, 17, 18, 19, and 20, may be regarded as typical examples, the first of these being decorated with red and blue lines alternately on a light fawn ground. Nos. 21, 22, and 23 are fragments only of moulded and modelled pottery of novel design, all highly glazed and decorated in front with purple, blue, and green, in very effective manner, while the interiors are coloured beautifully with turquoise blue. Fig. 23 has green leaves on a black ground. It is a matter of regret that only small fragments of this remarkable ware have been met with. They come from Gurob, as do also the originals of figs. 24 and 25, two beautiful blue jars decorated with patterns of lotus leaves and flowers.

The green-glazed lamp, fig. 26, also comes from Gurob.

The exibition will remain open to the public, at Oxford-mansion, until October 11.

THE COMPETITION FOR THE WORCESTER VICTORIA INSTITUTE.

THE Worcester Victoria Institute is at present housed in a most inconvenient building, and it has been proposed to erect a building, to cost about 20,000*l.*, providing ample accommodation for a free library, an art gallery, and museum, and in connexion therewith technical, science, and art schools. Mr. Waterhouse, R.A., was retained by the committee to act as assessor, and out of the large number of sixty-eight sketch designs the following six firms were selected and invited to prepare designs in more detail. Messrs. J. W. Simpson & E. J. Milner-Allen, Strand, London; Messrs. Smith, Woodhouse, & Willoughby, Manchester; Messrs. Theo. Moore & W. Henry White, London; Messrs. Salter & Adams, London; Messrs. F. C. Ryde & Bedford, Great George-street, London; Messrs. Walter Cook & G. H. Grocock, Cardiff. These six firms will share the sum of 300*l.*, in accordance with the conditions, whilst Mr. Waterhouse has awarded the first place to the designs of Messrs. Simpson & Milner-Allen.

The decision of the assessor we can confidently assert will be fully endorsed by all who will take the trouble to carefully examine the designs.

A short description of the site will explain the difficulties that had to be contended with.

The site, which is fairly level and of oblong shape, adjoins the premises of the Shire Hall, is bounded on the west by Foregate-street, on the east by Sansome-walk, and on the south by Taylor's-lane, which is a footpath with a width of 10 ft. The opposite side of Taylor's-lane is occupied by houses and cottages, whose windows dominate the opposite property to a greater or less degree, but with the intention of minimising this restriction it has been decided to widen Taylor's-lane to 20 ft.

In careful and skilful evasion of these restrictions of light, Messrs. Simpson & Milner-Allen far surpass their competitors, and to the cleverness of the plan their success is mainly due, for the elevations are kept very plain in character, with a view to keeping the cost within reasonable bounds.

In every case competitors have placed the library block at the Foregate-street end, and the schools block facing Sansome-walk.

Messrs. Simpson and Milner-Allen plan their library entrance at the corner of Foregate-street and Taylor's-lane, leading through a porch kept low on account of the dominating light; from the vestibule opens the news-room, facing Foregate-street, with book-store adjoining. The reference reading-room faces Taylor's-lane, and adjoins the committee-room. The librarian's office is conveniently and centrally placed, adjoining the book-store. A spacious staircase with corridors, overlooking Taylor's-lane, leads from the vestibule to the upper floor, where ladies' and gentlemen's retiring-rooms occupy convenient positions at the head of the stairs. Museum-rooms face Foregate-street, with art-galleries, top-lighted, *en suite*, behind them.

Another staircase, with lift adjacent, is placed in the south-east corner.

The entrance to the schools block has been placed in the centre of the Taylor's-lane frontage, and leads to a corridor parallel to the lane; on either side of entrance ladies' and gentlemen's lavatories have been provided, but these are only carried up to the first floor level to prevent obstruction to the adjoining lights. The lecture theatre faces Sansome-walk, whilst class and other rooms and laboratory occupy the north side of the corridor.

The art school is also conveniently arranged on the first floor. The antique, master's, and modelling rooms all have good north lights, whilst the elementary room has been placed over the lecture theatre, facing Sansome-walk. A good position has been reserved for a conservatory over the entrance, and the south aspect appears to be suitable. Caretaker's rooms occupy a second floor. The basement has been divided between a technical school and the necessary chambers for heating, storage, and other purposes.

The ancient lights of adjoining properties have been most carefully considered and successfully dealt with. There is but one window with which any fault can be found, and that lights the museum and overlooks the Shire Hall Lodge. This will, no doubt, be remedied at an early date.

The remaining designs we must mention in the order in which they hung on the walls.

Messrs. Stephen Salter & Adams, in their design, have placed their entrance to library at the corner of Taylor's-lane and Foregate-street, with news-room facing the latter, and the book-store in the north-east corner, the reference reading-rooms facing Taylor's-lane adjoins the committee-room; but the librarian's room should have occupied a much more central and controlling position; the lavatories are hardly placed in an accessible position, as far as the news-room is concerned. The rooms also are badly proportioned in many respects. The schools block is deficient in method of plan in several instances. Placing the ladies' over the gentlemen's lavatories on a mezzanine floor, for instance, is open to objection; and the entrance in the centre of the Taylor's-lane front would have better utilised the long corridors. The ancient lights have not been completely dealt with.

The designs submitted by Messrs. Smith, Woodhouse, & Willoughby show several original features. The elevations show considerable grace in their treatment of necessaries of a somewhat municipal character. The cost of the building would, however, prevent the adoption of this design. The school block has been carefully planned, and it is a pity that the library block is not free from its defects.

An entrance is placed in the Foregate-street front with a large vestibule for statuary, which leads by a staircase to the first floor galleries only. The entrance to the library is kept quite distinct and is reached from Taylor's-lane, with news-room on the left and reference reading-room on the north. The position of the librarian's room in the extreme north-west corner behind the book-store facing Foregate-street is an unfortunate one.

The school block has been provided with entrances in Taylor's-lane and Sansome-walk and a corridor running parallel with the lane. The lecture theatre occupies the north side of this corridor. The art school on the first floor shows the elementary art room facing Sansome-walk, whilst the antique and painting-rooms have north lights.

Sufficient attention does not appear to have been given to the ancient lights on the south side, whilst small windows appear overlooking the Shire Hall Lodge. The elevations have been carefully designed and, with the exception of the elevation to the school facing the Shire Hall, which is plain, bordering upon ugliness, shows fairly satisfactory Renaissance treatment.

Messrs. F. C. Ryde and Bedford's design differs from the others in several respects. A large and massive tower occupies the north-west corner adjoining the Shire Hall Lodge, and the best portion of the centre of the Foregate-street frontage is devoted to vestibule. The news-room is carried along the north side with book-store opposite the entrance. The reference reading-room is placed with the committee-room facing Taylor's-lane.

The proportions of these rooms are unhappy in several instances, and we consider the tower too massive in its proportions for the rest of the design. Any dignity it might possess in execution would be nullified by the presence of the insignificant lodge of the Shire Hall at its base. With this exception the elevations show a great deal of quiet grace. The plans are capable of considerable improvement in many ways.

The designs of Messrs. Theo. Moore and W. H. White are an interesting study. It is a matter of regret that the really artistic treatment of the elevations should have been coupled with several serious defects of plan and inattention to the dominating lights of adjoining property. The expense of this design also disqualifies it at once.

The elevations to Foregate-street and Sansome-walk specially deserve notice. The Foregate-street entrance is at the base of the tower, and leads to vestibule. A large news-room is placed at south-west angle, with book store and reference reading-room adjoining. The committee-room occupies the north-east corner.

Little attention has been given to ancient lights in Taylor's-lane, and windows have been opened on the north side which clearly infringe upon the right of the Shire Hall property. The authors of this design would have been well repaid for a little more attention to the practical solution of the problems of the design—viz., cost on improved plan, and closer attention to questions of light. The fate which overtakes the design is to be regretted, as far as the elevations are concerned, though it is thoroughly deserved owing to the defects already mentioned.

Want of space prevents us fully noticing the designs of Messrs. Walter Cook & Grocock, of Cardiff.

There is satisfaction in seeing a competition decided in favour of the architects who most closely and satisfactorily carry out the instructions given, and we are satisfied that Worcester is selecting the most practicable and satisfactory of the six designs submitted, and that the award of Mr. Waterhouse is a right and fair one in every way.

ON THE TECHNICAL EDUCATION OF ARCHITECTS.*

THE words in which the title of this lecture is expressed imply obviously that there may be various sorts of education. Education may, in fact, be directed towards the attainment of different results; or, in other words, may have different aims. These different aims form, indeed, a part of the subject which must receive some attention at the outset, and must not be lost sight of through the lecture, since it is the difference in the results aimed at which should suggest differences in the means employed.

I do not think any excuse is necessary for selecting to-day a subject very similar to what I have spoken upon before. The circumstances, if we give them a moment's attention, not only suggest but almost prescribe this subject. This year, for the first time, the examinations established by the Institute of Architects will all be held, so that we now first have a practical and complete demonstration of what those best fitted to judge consider should be the aims of adequate technical education for architects. For the first time also a scheme for an educational curriculum, not drawn up theoretically,

* Being the opening lecture delivered by Professor Roger Smith to the Architectural Classes of the University of London (Session 1890-91) on October 2, 1890.

but with a view to practical use, has been put forward by the students themselves. That this scheme, embodied in the proposals of the Special Committee of the Architectural Association, has not yet been adopted by that body, leaves one to some extent free here to comment on its provisions. Suggestions, if good ones, can still be considered, and may still be serviceable. Later on, when a scheme had been definitely adopted, I for one should consider it wrong to do more from this chair than wish it well, and watch its working with interest, as I should any other definitely-accepted programme.

Education, such as a cultivated professional man requires, may, if we attempt its analysis, be characterised as *Initial*, *Liberal*, *Technical*, and *Practical;* and while each of these four words refers to a distinct aim and, to a great extent, to a different series of studies and a distinct course of training, all four are so intimately mixed up together that we can only partially disentangle them. We may, however, go so far as to say that the aim of the Initial is one of immediate utility, namely, to give ordinary elementary and general instruction, and to develope ordinary powers of learning and remembering. The aim of the Liberal is to enlarge, expand, and strengthen the mind and enrich its stores of general knowledge and powers of action; that of the Technical is to impart such theoretical or scientific knowledge, or to teach such accomplishments as are necessary or desirable for the pursuit of the profession selected. The aim of Practical training is to actually teach the practice of that profession.

The initial training may be dismissed very briefly. We all understand what is meant by a plain English education, though few of us ever stop to think what an enormous stride the child and the boy take while receiving it. I doubt whether any advance afterwards is so great as that made by the child who, during his first five years, more or less masters language. To emerge from the condition of knowing nothing into a state in which you have mastered a vocabulary of several hundred words, and can remember them, can use them correctly, and can understand them when addressed by others to you, is, I think, an advance greater than is ever made in after-life. Nor is the student, youth, or man ever able again to take such a great step, or to enrich his stock of mental possessions with so valuable an addition as when first he has mastered the art of reading, and instead of being dependent for all information and every idea of every sort upon the individuals he is able to talk with, he is made free of that accumulated store of knowledge, wisdom, fancy, or frolic which is the birthright of every one who can read English.

Though this is happily true, and the general effect of brightening and expanding the powers of a youth's mind, which by degrees follows, is of the utmost importance, it is not the main object aimed at. The scholar in this respect is like a man who while digging his field to get in a crop, finds a buried treasure. His aim was potatoes or turnips, or whatever mere food he had sown, and if he got something more precious it was not any part of the expected crop. He had not sown it. That which we may consider a sufficient initial education for an architect may be found described in the programme of the preliminary examination of the Institute of Architects. You will find no subject introduced there which will not be of direct use to the young architect, and no subject carried further than will undoubtedly be required by him.

He is to write from dictation, and is expected to show a legible handwriting, and to mind his stops and capital letters. He is then expected to write something intended as a test of powers of observation and description, which means, I presume, that he will be asked to describe something which has been or is under his notice. Arithmetic, including the rule-of-three and fractions, two books of Euclid, and a very elementary amount of algebra, the geography of Europe, and the history of England, are also required of him, and either one modern language or Latin, with elementary mechanics and physics. These subjects are taught in any good school, and any examination certificate which shows that a candidate has proved to a competent tribunal that he is fairly well educated, is accepted in lieu of going through the paper, and with reason, as, in all probability, the standard will have been higher if the subjects may have differed a little. Lastly, a certain proficiency in drawing is required. This in an ordinary schoolboy may be looked upon as something of an accomplishment, but as any one would be mad to think of making a youth an architect who does not show that he can draw, this in the present programme is only a strictly utilitarian subject; and, speaking generally, it would be easy to show that each one of the attainments named in the programme is important—I think one may say essential—to the intending student of architecture who wants to make progress.

I turn next,—and turn with pleasure,—to that part of education which I have termed liberal, and the aims of which I have described as being to enlarge, expand, and strengthen the mind, and enrich its stores of general knowledge, and powers of action. "A liberal education" is not so often spoken of,—nor, let me add, so frequently aimed at,—now as once was the case; but there is no adjective that so truly expresses the best aims of this the best sort of training and teaching. Instead of keeping the boy at school as few years as will just suffice to get a minimum of knowledge, to send him to Oxford or Cambridge for three years more,—instead of limiting his subjects to those most likely to make him get on in the world, to include those which will make him an abler, a better informed, and a more cultivated man; to provide him with resources for leisure, sickness, or old age; to make the best of any powers, faculties, or genius with which nature may have endowed him, and to teach him some accomplishments, and take him at least to the threshold of the temple of learning,—this is to educate a youth liberally. Of course, in many cases, this is out of a father's or a guardian's power from pecuniary reasons; in others, I fear, the student himself fails to understand what a priceless advantage is within his reach, and declines the opportunity; or, what is worse, has it and wastes it. But when it is possible, no greater kindness can be shown to a young man, than, to some extent, and in some way (not necessarily by sending him to an university), to give a liberal character to his education.

Two generations back the classics—that is to say, the languages and literature of Greece and Rome—were invariably the subjects studied by all who were desirous of becoming cultured men, with, in many cases, the addition of pure mathematics.

There can be no doubt that Greek and Latin, well mastered, have produced, as a rule, a remarkable effect upon the mental powers of the student, and if carried far enough to enable him to acquaint himself with the unrivalled literature in those languages, especially that of Greece, they have proved invaluable as educational instruments; and the same, in another way, has been the case with mathematics.

At the present day other studies run the classics hard, so to speak, and are advocated as equally valuable mental discipline, and as more useful in after-life. I am, fortunately, not required to embark on this sea of educational controversy, as the hearers, and most of the readers, of this lecture have passed the time when it is decided how far a man's scholastic education is to go, and on what lines it is to run. Only let me heartily congratulate any who have had the good fortune to receive a classical education, on the circumstance, one which ought to exert a beneficial influence on their whole career. And it may not be amiss to ask why this should be the case.

The study of language is really the study of thought,—words embody thoughts. Grammar consists in the orderly arrangement of thoughts. Literature is a record including the most cultivated, powerful, valuable thoughts of the world. Hence, in studying language you are indirectly studying thought,—learning to think, learning how others think; in studying literature you learn how others have thought. But why a dead language? There are several reasons; but the chief one, no doubt, is that the study, to yield its best fruit, must be more thorough than it can be where the language is spoken, and the learner acquires many phrases, modes of expression, and a host of words in a more or less loose colloquial manner.

I should, however, be the last to assert that the study of the classic tongues is always a liberal or an improving study. If only carried on a little way it is nothing but drudgery. If carried out in the perfunctory spirit which just studies the authors set down for matriculation or B.A., as the case may be, and deems every hour not spent in coaching for an examination sheer waste, that, forsooth, is not a liberal study, or likely to improve the mind.

On the other hand, any study worth calling by the name, given to the acquisition of any important art, science, or literature, if carried on in a liberal spirit and directed to the aim I have pointed out, is improving to the mind,—is *ipso facto* part of a liberal education. It is doubtful how far either art or science, if directed solely to some immediate profit, can bear this character in its effect on the learner. To be really liberal, study must be pursued partly, at least, for its own sake, with a desire to make a knowledge of, or skill in, some subject thorough and complete.

Science is largely now substituted for literature as a subject of study in places of higher education, and, perhaps, rightly, for this is the age of science, and the qualities and temper of mind fostered by scientific study are greatly needed now.

Fine art, though a branch of an architect's technical education, is really what may be called a liberal subject, and I urge you all to pursue it in a liberal spirit. Give attention not solely to architecture, but to the allied arts of painting and sculpture, and to the allied science of archæology. Study architecture in foreign travel as well as by stay-at-home work. Try to understand the principles of decoration and of applied art; visit and carefully examine good picture-galleries, and widen and deepen your knowledge of the arts as a whole, by every means in your power.

No young man whose actual schooling or college course is over, and who is occupied,—perhaps busily occupied,—in learning his profession, or earning his living, ought to consider that his education, with the exception of professional study, is over. He ought to carry it on for years to come the best way he can. If I am asked how, I would suggest first of all by keeping up, and, if possible, extending what he has got. If you have learned a language, for example, such as Latin, German, French, or Italian, do not let it drop. If you have mastered the rudiments of a science, try to carry it further, and certainly (as already suggested) do your utmost to extend your knowledge of fine art.

One, and that a very accessible and interesting method of cultivating the mind, is the pursuit of English literature. Our best authors' prose and verse, fiction and fact, provide a literature of the greatest possible value, and if there is nothing else that you do for the next few years by way of mental culture apart from all other and more necessary work, at least I pray you to make yourselves acquainted with the writings of Spenser, Chaucer, Shakspeare, Pope, Milton, and Tennyson, and of Goldsmith, Addison, Johnson, Swift, Macaulay, Carlyle, Scott, George Eliot, and Thackeray, and in some cases not merely read, but re-read, study, and analyse them.

Technical and practical education, though now to some extent separated, could till lately hardly be thought of as two separate things,—at any rate in our own case, or indeed in the case of several other professions. The apprentice learned practice as he still learns it, by working in it, and if he gained theoretical knowledge, he obtained it at the same time, and as he best could,—partly, I may say, since this class was instituted, in this class-room. Now in all professions an effort is being made to impart technical training of some sort by a machinery created for the purpose. Perhaps it will clear the way for the topics which I chiefly desire to dwell on if the two other observations that ought to be made about practical professional education are made at this first stage, before rather than after we reach the technical.

For no profession is a theoretical or collegiate education, however complete by itself, an adequate preparation. Probably at the present day no system of professional education is so complete as the medical, and apprenticeship is there done away with. But the reason is, that in the hospitals, and outside them, a vast field of practical experience under the most eminent examples and teachers is open to the student, and he, for much of his long and arduous period of studentship, is labouring night and day in the wards of the hospital where he is studying, or among the poor in their own houses in the province which the hospital serves, or at the out-patients' department. Meantime, every sort of disease, and every sort of surgical case, is being so treated by the first men of the day under his notice, that the student not only knows and sees all that is done, but learns the reason why, and, as a dresser or a clinical clerk, and later in higher appointments, takes as

active a part in the work as the progress he has made renders possible. For few professions, again, has a scheme of thorough instruction been so completely elaborated as for mechanical engineers in this college, lately under Professor Kennedy, and now Professor Beare. Yet let a student go through this whole scientific course, take his degree, and master all that can be taught in this or any college, and the first thing his friends find is that he must now be articled to an engineer for about two years to work in the pattern-shops, the fitting-shops, the forge, and so forth, wearing the dress and doing the work of a mechanic. The same thing is true of any practical profession. The practice can only be learnt by practice.

As a result, I think it is not likely that the practice of apprenticeship, or, to give a more dignified name, pupilage, will cease in our profession. This was hardly my belief years ago, but the more I have seen and experienced of what can and what can not be learnt under class instruction and under pupilage respectively (and I have had more opportunity than most of comparing the two), the more I am convinced that neither can dispense with the other. True, it is quite possible that changes in form may take place. A radical change did take place when for the old apprenticeship for seven years was substituted the now customary short term of three years, and this alteration, made as it was without the necessary and corresponding provision of means to supplement this brief period by some course of preliminary or concurrent systematic study, has flooded the profession with young practitioners, not a few of whom are, to put it bluntly, lamentably ignorant.

What ought *now* to become customary, and I hope will, would be for any young man who is to be an architect, to take a well-arranged course of preliminary technical instruction extending over one year at least, and, when practicable, over two, and then to begin his three years as a pupil, continuing part of his theoretical studies in his evenings, and doing the practical work in the day. And I propose, in considering the technical education of an architect, to try to point out what kind of course such a student should take up, and incidentally to show what facilities this college presents for such a course.

Coming now to a closer examination of the technical education of architects, some of us may feel that the phrase "technical education" has been used again and again without any attempt to define, or even to comprehend, what is meant. Of this phrase, now on every one's lips, I have never seen a definition attempted, and I confess to feeling not a little difficulty in suggesting one. It might at first sight be thought that "teaching an art" corresponded very closely to the sense of the words, but this is not quite what is meant at the present day, and probably "training for an art" more nearly expresses what is done in those noble institutions where those who are to pursue useful arts are receiving instruction, directed partly to teaching them to understand what they will have to do, and partly to develop such skill, manual or mental, and imparting such knowledge as shall help in the acquisition of practical power. What goes beyond this—like the medical curriculum to which I have alluded—is called, and properly called, practical professional education. As the popular technical education movement for artizans is understood and carried out, it is not to be supposed that the institution will educate pupils into skilled artizans ready to work, but that it will supply them with such theoretical knowledge, and possibly develop in them manual skill in such work, for example, as mechanical drawing, as will enable them to become better artizans than they otherwise could be.

So with architects. The technical education of architects has special reference to their instruction in the science and in the theory of this profession and their training in the skilled arts, such as draughtsmanship, which it is requisite for them to possess.

A statement of what this technical education for members of our profession must consist of, is to be looked for, if anywhere, in the programme of the intermediate and the first examinations established for the Institute of Architects.

The candidate in the intermediate examination is required to do as preliminary work a considerable amount of drawing, and this will of course be looked upon by the examiners, first, from the point of view of draughtsmanship, and then, if sufficiently well drawn, scrutinised to see what evidence it gives of familiarity with the general forms, the details and the ornaments of the orders and of English Gothic architecture, and to some extent with what is known about the buildings from which the examples are taken; and, further, in respect of construction, to see whether it gives evidence of some acquaintance with carpentry and joinery. The written and oral examination on art subjects is to take the same range as the drawings cover. That on construction includes the nature and employment of all the ordinary building materials, the calculations usually made in connexion with the stability of buildings and the principles of construction, and a moderate amount of applied mathematics and physics. This examination it is expected that a student can pass in the course of his pupilage. When his studies have been carried so far with the addition of practical work that he is presumed to be fit for admission to the Institute as an Associate, the programme of the final examinations requires evidence of a good general knowledge of architectural history and an acquaintance with the mouldings and features of the various styles, and of a thorough acquaintance with these in the use of some one style; and it also requires the candidate satisfactorily to prepare a design for a building. The scientific subjects may be summarised as nearly the same as in the intermediate, with some omissions and some additions, that is to say, materials, construction, and the calculations necessary for ascertaining the strength of materials and structures, but with the addition of sanitary science, and the omission of applied physics and mathematics. Of course, however, the student would be expected to know more about the subjects which appear twice in the final examination than in the second, subjects that may be considered as belonging specially to practice, including specifications, estimating, and, to some extent, professional practice, and dealing with unsafe buildings, though, of course, on the one hand, much of the construction and of the preparation of a design require practical skill as well as theoretical knowledge; and, on the other, professional practice itself is a very suitable subject for class instruction.

This statement is necessarily made in very general terms, and, in some cases, a single word in it, as, for example, construction or drawing, covers a very large and varied range of subjects, though all closely connected together. Still, we are now in a position—putting the three programmes together—to say that the education of the architect ought, in order to conform to the Institute minimum, to include, at least, drawing, elementary mathematics, and physics, and their application to construction. The history and the actual forms, features, and details of architecture, materials and construction, and sanitation, together with reasonable skill in designing and in preparing working drawings and specifications, and in estimates. Professional practice and dealing with dangerous structures are also required.

It is difficult to separate the whole course of the architectural development of the young practitioners into two halves and say this portion is practical and that is technical. What is learned in the class-room must be corrected on the scaffold, and, on the other hand, what is learned in the office must be elucidated in the class-room. But it is at least possible to point out what parts of this complex whole a college may with advantage propose to supply, and if we do as much as this we shall have carried the subject as far as in a single lecture it can be possible to advance it.

The Committee of the Architectural Association, taking these very examination-schedules as the acknowledged guides, have prepared a suggested programme of technical education for architects, to be carried out entirely by means of evening work, and entirely by classes and lectures to be established by the Association, and this, which must be familiar to you, now claims our attention.

It appears to me very doubtful whether the technical part of this programme can be thoroughly and efficiently carried out by evening work alone; and though, of course, the conditions under which the Association works entirely preclude their Committee's shaping its programme otherwise, there can be little doubt that this is a weak point in the proposals contained in the report.

Again, there can be very little doubt that an Institution like the Association, if it is to become the Architectural College for the Metropolis, must ultimately be prepared to give instruction in all the subjects of study in this programme. But at the outset it appears to be an arduous task for it to collect competent instructors and to start classes in all the branches which are enumerated. There is not the smallest doubt that arrangements could be made to utilise existing Institutions, as, for example, this college for the Association students, so that they might take up some of these subjects under existing teachers, while others might be from the first taken at Conduit-street.

It happens to be the intention to go over all the subjects of the Institute's intermediate examination in the first two years of attendance, and those of the final one in the second two years. Students of the first two years standing are to attend classes or studio three evenings a week for three hours each evening, and those of third and fourth years' standing are to attend three evenings one week and four the other. All students would on one evening have two consecutive lectures or classes of one and a half hours each, which seems to put a strain upon them, and once a fortnight the third years' students are to have two such evenings. This, if the scheme is carried out, may, I hope, be considered open to revision; an hour and a half is too long a period for a lecture, though it may not be for a class, and the advantage of two such attendances immediately succeeding each other appears to me very doubtful.

Rightly, perhaps, the Report lays stress upon the fact that the Institute programme does not comprise all that a student of architecture ought to study, but it may be open to doubt whether the subjects outside that programme do not serve to overweight the course, already very arduous, set before the students in the curriculum.

And it seems open to question whether all these should not be more distinctly set aside as *extra subjects*, both as to position in the programme of education and as to their place in the distribution of time. If, for example, the alternate Fridays on which the Association does not hold its ordinary meeting were, throughout the four years for which the course lasts, devoted to lectures and meetings of classes on the extra subjects, there would be as many evenings given to them as are now proposed (studio work excepted), and they would be more distinctly set apart than they are. I am quite aware that considerations can be urged against this proposal, but being thoroughly convinced that the programme as it is is too full, I throw this out as a suggestion, for what it may be worth, as a way to lighten it without entirely removing any subject from the list.

Having now indulged in some criticism, let me turn to the more pleasant task of pointing out that this curriculum is in many ways an admirable statement of the subjects which students ought to become familiar with; that it has arranged them very intelligently, and stated them with much clearness, and that it forms a very good statement of what may be definitely included under technical education for architects. I need not add that it must be supplemented by practical education. It is in its very nature a programme drawn up for the use of students who are every day and all day long practically engaged in professional work, and to such men, if they are resolute enough and in the enjoyment of sufficient vigour and sufficiently good health, to work with a will through the number of hours devoted to study, it offers many advantages.

Of course, the actual success of this or any effort depends mainly on personal considerations—the resolution and abilities of the students; the aptitude and attainments of the teachers; and I know that those who drew out this scheme have not been unmindful of the fact that young men have only a certain amount of learning power left after a day's work,—properly done,—and of that other fact that men of cultivation who are apt to teach and willing to accept what must necessarily be a modest remuneration for teaching are not very easy to find. One other sort of person will, I think, also be required, though no hint of him or his office is included in the report, and that is a kind of general superintending and advising head, who shall be able to give counsel, direction, sympathy, and encouragement to all the students, and to all the instructors.

With very sincere good wishes for the prosperity of this new departure at the Archi-

tectural Association when it actually, after due discussion, gets into working trim, I pass on to consider what those can do who are rather differently circumstanced.

In a very considerable number of cases the men who propose to become architects are in sufficiently easy circumstances, or are fortunate in having friends able and willing to allow them sufficient time and to do for them whatever may be best to procure them an education that will fit them for the higher walks of their proposed career, and incidentally for passing the examinations, with a notice of which this paper opened. Such men, coming either from a good school or from college, are particularly well prepared to benefit by work in a collegiate institution like the one within whose walls we are met; and if they can have one session, or in some cases two, at University College, London, and can occupy their time in receiving technical education here, they will no doubt be far better fitted for taking advantage of the professional training that will follow than they could otherwise be.

We know the subjects. Let us see how a man with a year to devote to them might here take them up. Generally, I should like to say, the student in any classes which he attends here will find the Professors to be men who have been carefully selected as men of high standing and reputation, well acquainted with their subjects, in many cases highly distinguished in them, and in not a few cases, also, their fellow-students will be the men from among whom the eminent practical workers of the next generation will rise, men who come here from institutions where they have had an excellent preliminary training, bringing with them habits of study and good elementary information, and whom it is a great advantage to have as fellow-students. Nor are the fine library and the general organization of the whole place for purposes of study to be overlooked. They form, in fact, elements of great value in estimating the use of such a College as this to the students who frequent it.

The subjects which students with a year at their disposal ought to take up will vary with the progress they have already made, but Elementary Mathematics and Applied Mathematics and Mechanics (especially the graphical methods of calculation), will in almost every case be subjects which should be carried further than ordinary teaching takes them, and the junior course in each of these subjects, as conducted by Professor Hill and Professor Karl Pearson, should, generally speaking, be attended, including in this Professor Pearson's Drawing Class. I have very little doubt, however, that in not a few cases the student may come so modestly equipped with mathematical training, that the lower junior class—which takes up arithmetic, algebra, and geometry, and covers the subjects of the Matriculation Examination of the University of London—will be the one which they should attend. These would cover Mensuration.

Elementary Physics are the subject of a separate course; and land surveying and levelling form the subject of a course of practical instruction given by Professor Vernon Harcourt. This amount of instruction would supply the mathematical knowledge required for passing either of the examinations, and desirable in actual practice.

Sanitary Science, a subject essential for practice and for examination, is taught here by Dr. Corfield, the Professor of Hygiene, a man who deservedly holds a high position as an authority on this subject. It is manifestly wrong that a man whose profession it is to design and erect houses, schools, hospitals, and all other sorts of places where men and women are to reside and work, should be in any respect deficient in acquaintance with the laws of health, and the plans to be followed and the precautions to be observed in rendering buildings safe and salubrious, and in correcting defects in old buildings. The very existence of the distinct profession of a sanitary engineer, is something of a reproach to the architectural profession.

Elementary Chemistry and Geology are subjects intimately connected with the architect's work, and for the study of which in this College provision is well made. These are not set down as examination subjects at the Institute, but they are most desirable to know, and, of course, whenever the honours examination is instituted, they will form some at any rate of the subjects of examination.*

* We will give the conclusion of this paper next week.

Illustrations.

A TRIUMPHAL ARCH AT TIMEGAD, ALGERIA.

THERE are few spots in Algeria which possess a greater interest to the architect than the site of the Roman city of Thamugas, better known by its modern name of Timegad. Of its history, like other cities and towns in this great Roman colony, we have but little knowledge, except what can be gathered from the numerous inscribed stones that lie scattered in every direction over a large area of ground. In the Itinerary of Antonine it is called Tamugada, and Ptolemy, the geographer, speaks of it as Thamutuda. In later times it is mentioned as Thamugas, and as it became in the fourth century the seat of a religious agitation the names of several bishops of Thamugas frequently appear in early Christian writings. When Solomon, the Byzantine general, arrived at the gates in 535 he found the city in ruins, so we may assume that, with the fall of the Roman Empire, Thamugas shared the fate of other towns in North Africa, and became a prey to the horde of Vandals who swept across the country early in the fifth century, carrying nothing but fire and destruction, and leaving behind them blackened masses of stone and brick. The ruins cover a large surface of undulating ground, forming the lower northern slopes of the Aurès range, and, owing to the excellence of the building materials, and the use of a good deal of hard blue limestone as well as of marble, decay is little noticeable in many of the overthrown blocks and votive monuments. The Forum, which was partly unearthed a few years ago, still retains its original paving, and the bases of the shafts forming the internal and external colonnades are many of them undisturbed. The Theatre, now buried in 16 ft. of earth, the walls of the Basilica, the overthrown Temple of the time of Valens, dedicated to Jupiter Capitolinus, and of gigantic proportions, are sufficient to give an idea of the rich field for research still awaiting the spade of the explorer.

The most important of the monumental remains is a triumphal arch occupying a prominent position on the north-west side of the town, and visible from the plain below at a distance of several miles. Its present ruined condition is apparently due to an earthquake, evidenced by the position of some of the blocks in the upper part of the structure. The attic, with the dedicatory inscription, has been overthrown, but several fragments restored by M. Leon Renier leave no room for doubt that the arch was dedicated to Trajan by the 3rd Augustan legion, whose headquarters were at Lambœsis, some twelve miles distant from Thamugas in a westerly direction. The mass of the structure is of sandstone, but the columns and all the decorative features are entirely of white marble, and there are indications of the attic having been faced with slabs of the same material. The drawing, which is here reproduced, was made on the south-west side, to avoid the glare of the sun when sitting in an opposite direction; but, by comparing it with a sketch by Bruce in 1765,* it will be seen that the eastern side is in far better preservation, and the main features of the composition are more easily studied. The podium of the monument is almost buried in sand, but a few apertures between the fallen masses reveal not only the base of the structure, but parts of the original paved roadway. The arch itself, as shown in the restoration here given, had the usual features common to similar memorials that recorded the beneficence of an Emperor, or marked the victories of a great people. Exception may be taken to the broken pediments as a debased feature in classic composition, but it must be admitted that picturesqueness is gained by the use of this doubtful expedient. The subsidiary columns, resting on corbels, which flank the two side recesses, are unusual, and are certainly pleasing to the eye. This arrangement imparts a richness to the monument, which in other respects is devoid of ornamentation. It should be mentioned that the volutes of two of the capitals of the principal order are in the form of eagles. The colonnade in the distance, shown on the drawing, is that of the forum already referred to. Portions of the wall, forming the fronts of a series of shops, are still standing. The bases of the shafts are undisturbed as well as of the piers and columns of the central gateway.

Thamugas of the Romans must have been a pleasant city to dwell in. The configuration of the surrounding country had many charms. The hills, now rugged and bare, were then clothed with timber. The great plain that stretched far and wide in front of the city, now treeless and unpeopled, was then a garden of productiveness and dotted with the farmsteads and villas of successful colonists. The surface of the soil, now scratched here and there with rude implements of husbandry, was then tended and irrigated, and, owing to its wondrous fertility, helped to fill the granaries and storehouses of Rome. It is piteous to observe so fair a land converted into a desert, and to mark the lamentable results of long centuries of ignorance, neglect, and misrule.

> "Strange—that where Nature loved to trace,
> As if for gods, a dwelling-place,
> There man, enamour'd of distress,
> Should mar it into wilderness."

ALEX. GRAHAM, F.S.A.

* "Travels in the Footsteps of Bruce in Algeria and Tunis." By Sir R. Lambert Playfair. C. Kegan Paul & Co., London, 1877.

HOGHTON TOWER, LANCASHIRE.

AMONGST the many historic halls of Lancashire, Hoghton Tower undoubtedly takes first rank; indeed, with the exception of Haddon Hall, which it somewhat resembles, there are few Elizabethan halls in the country that can compare with it for picturesqueness. Standing on the top of a well-wooded hill, it forms a conspicuous object from the valleys of the Ribble and Darwen. It is built in the form of double courtyards, the outer one being divided by a raised terrace approached by a flight of semi-circular steps; the inner one, which forms the subject of the sketch, has within recent years been made into a garden with excellent effect. The life-size statue of William III. in the centre is of lead, and was brought from the neighbouring hall of Walton-le-Dale, pulled down in 1834.

After becoming dilapidated, and being abandoned as a residence, Hoghton Tower has been judiciously restored under the superintendence of Messrs. Paley & Austin, and is now the residence of Sir Charles de Hoghton, Bart.

Hoghton Tower is the scene of incidents depicted in Harrison Ainsworth's "Lancashire Witches," and it was here that King James I. is said to have knighted the loin of beef.

The following quaint description is by a local historian, Dr. Kuerden, who wrote about 1650. He says:—

"This tower was built in Queen Elizabeth's raigne by one Thos. Houghton, who translated this manor-house, formerly placed below the hill neare unto the water side. Betwixt the inward square court and the 2d, was a very tall strong tower or gate-house, which in the late and unhappy Civil Wars was accidentally blown up with powder, and some adjacent buildings, after the surrender thereof, and one Captain Starky with 200 soldiers were killed in that blast most wofully. The outward is defended with two lesser bastions upon the south-west and north-west corners, besides another placed in the midst betwixt them, now serving for an outward gate-house. The stately fabrick is inuironed with a most spacious park, which in former time was so full of tymber that a man passing through it could scarce have seen the sun shine at middle of day; but of later days most of it has been destroyed. It was much replenished with wild beasts, as with boars and bulls of a white and spangled colour, and red deer in plenty; the last as yet preserved for game by the lords thereof."

The drawing by Mr. J. Langham, from which the view is taken, was exhibited at this year's Royal Academy.

BULLERS WOOD, CHISLEHURST.

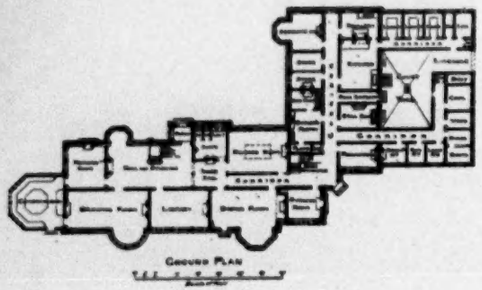
THIS house is an old one remodelled entirely. The old house was a fair sized villa, built about thirty years ago. The outside was "Italian," with a uniform covering of grey stucco, relieved by bands, bays, quoins, strings, &c., of painted cement. The roof was of very flat pitch, and covered with blue slates; it was also much cut up.

Where the old walls have been left they have been faced with red brick. The hall, staircase, library, and drawing-room are new, and a new tiled roof and wooden cornice has replaced the old. The new rooms are panelled, and have pattern ceilings and oak floors.

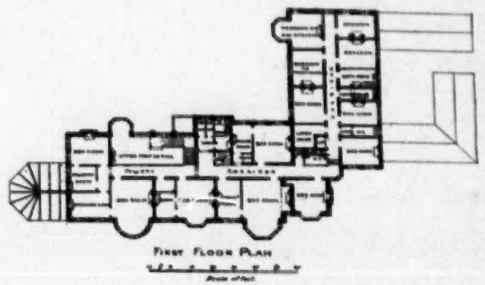
Outside there is a large forecourt on the south, a small one on the north, and a long

A Country House.

Louis Ambler, A.R.I.B.A. Architect.



Ground Plan



First Floor Plan

South Elevation, Carden Front.

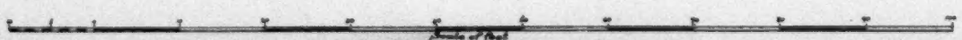
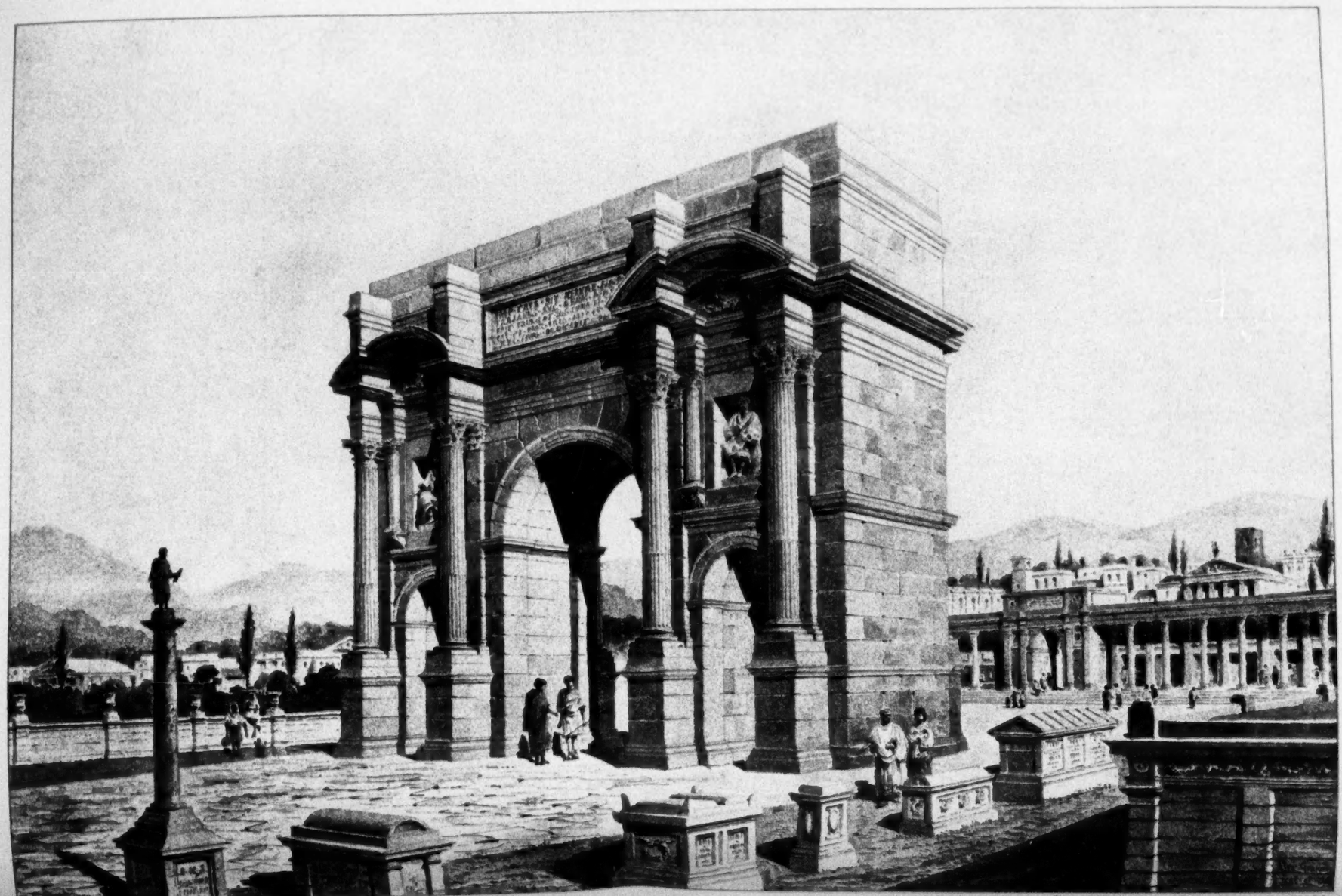


Photo-litho. Sprague & Co. 82 Martins Lane Cannon St. London, E.C.

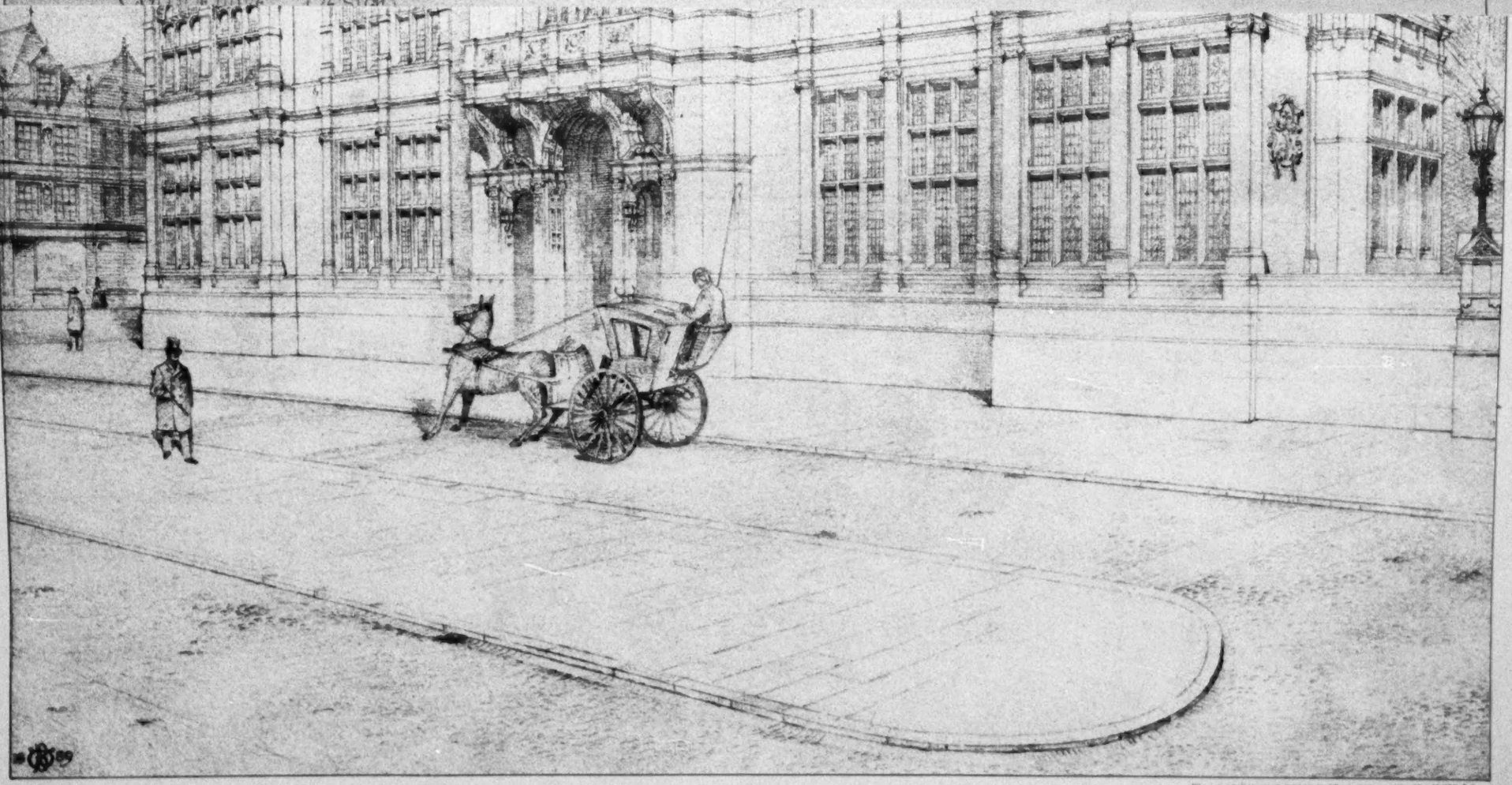
HOGHTON TOWER, LANCASHIRE: THE INNER COURT.—From a Drawing by Mr. J. Langham



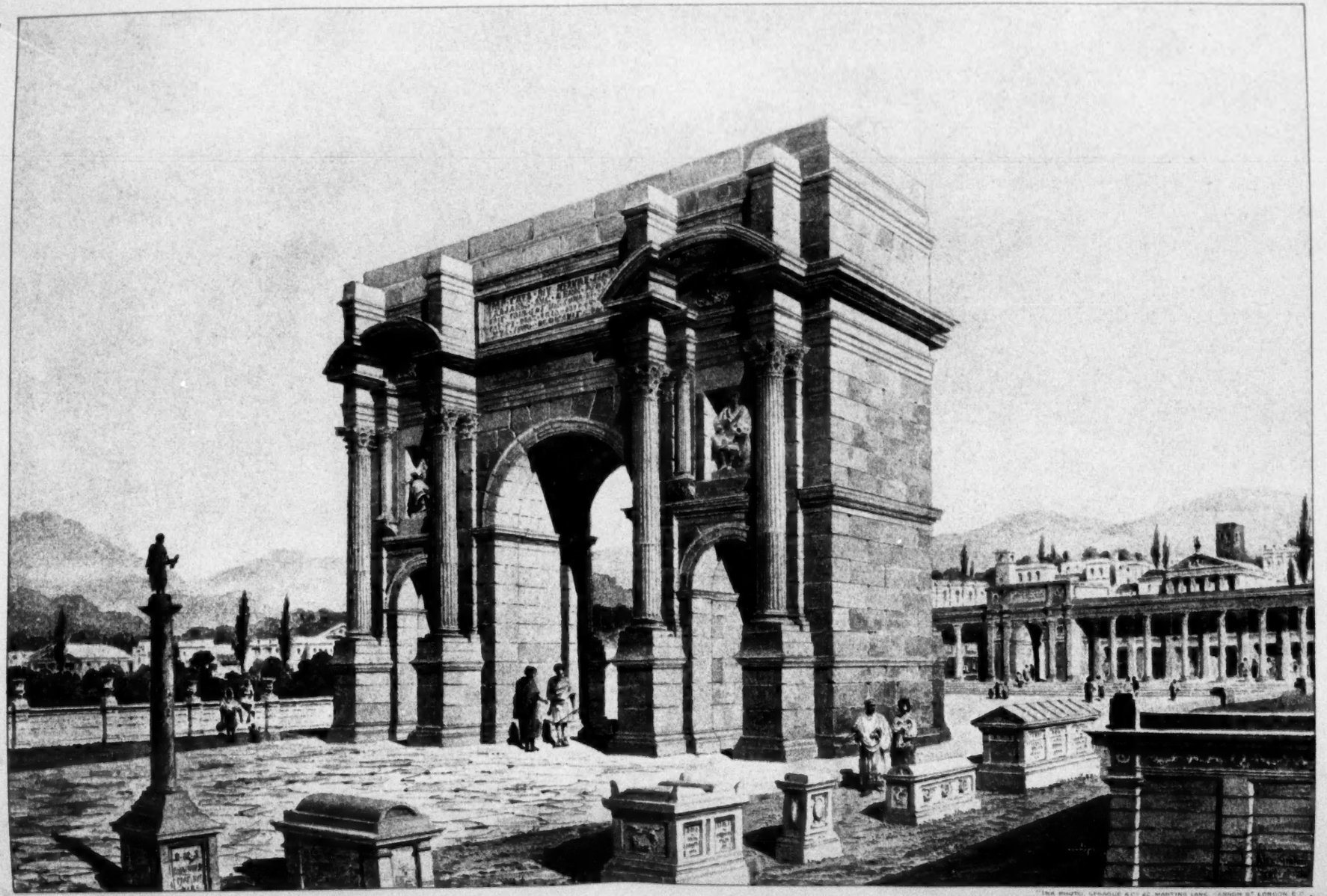
RESTORATION OF TRIUMPHAL ARCH, TIMEGAD, ALGERIA.—FROM A DRAWING BY MR. ALEXANDER GRAHAM, F.S.A.

Municipal Offices, Sheffield

Competitive Design



Royal Academy Exhibition, 1890

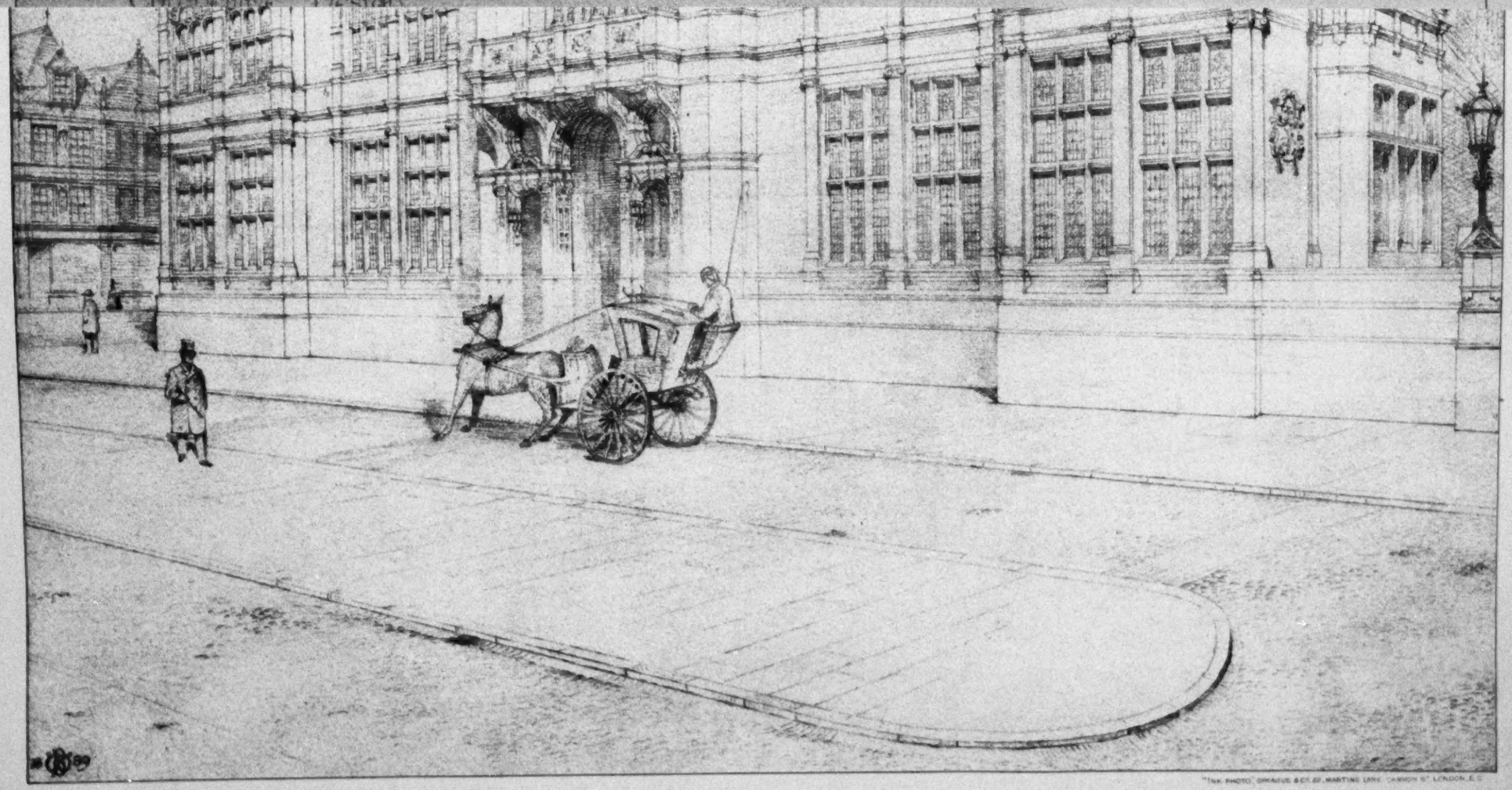


RESTORATION OF TRIUMPHAL ARCH, TIMEGAD, ALGERIA.—From a Drawing by Mr. Alexander Graham, F.S.A.

THE BUILDER, OCTOBER 4, 1890.

Municipal Offices Sheffield

Competitive Design



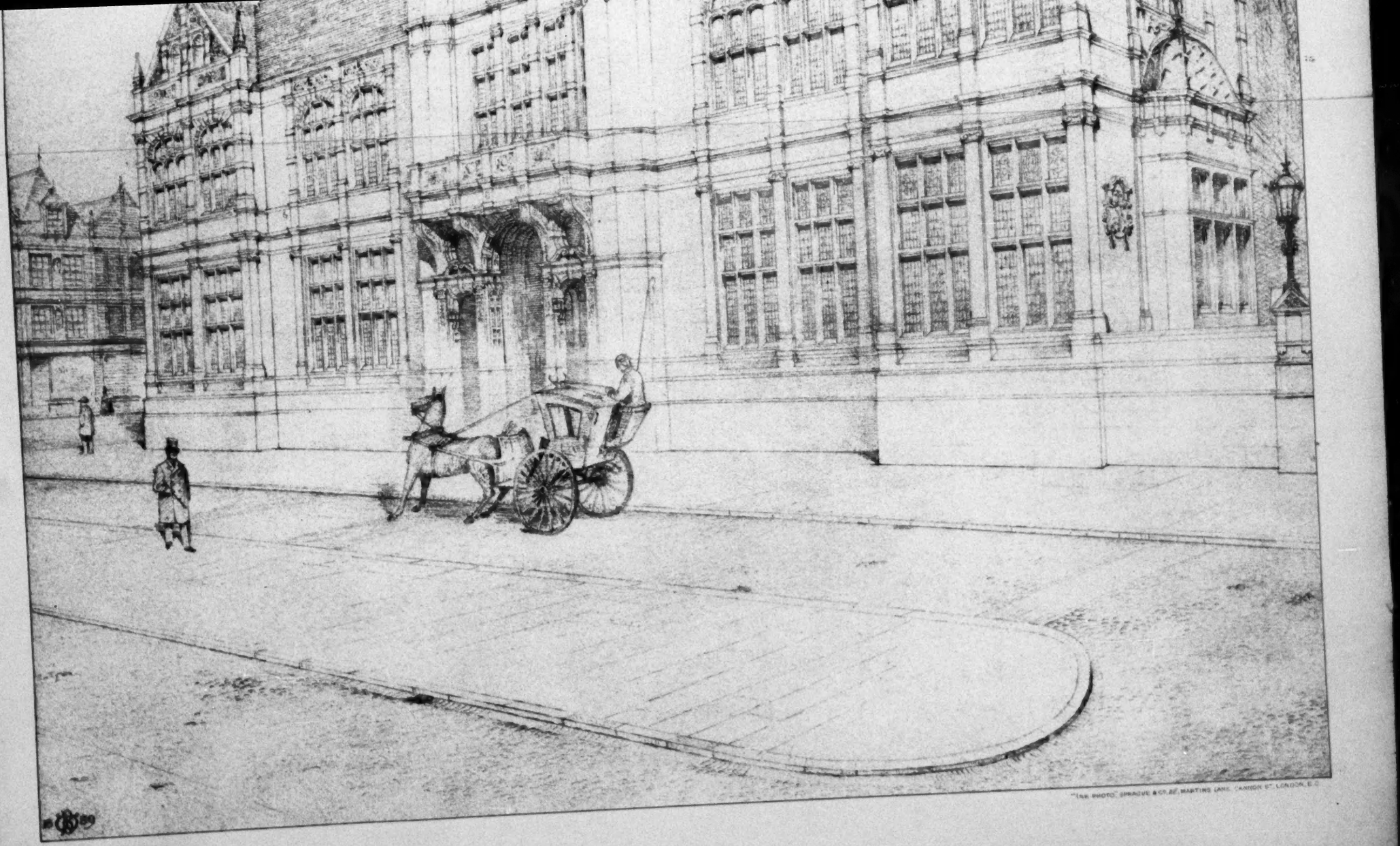
Royal Academy Exhibition, 1890

RESTORATION OF TRIUMPHAL ARCH, TIMGAD, ALGERIA.—From a Drawing by Mr. Alexander Graham, F.S.A.

Municipal Offices Sheffield

Competitive Design

B. Woollard, A.R.I.B.A.



Royal Academy Exhibition, 1890

TRIUMPHAL ARCH, TIMEGAD, ALGERIA.—From a Drawing by Mr. Alexander Graham, F.S.A.

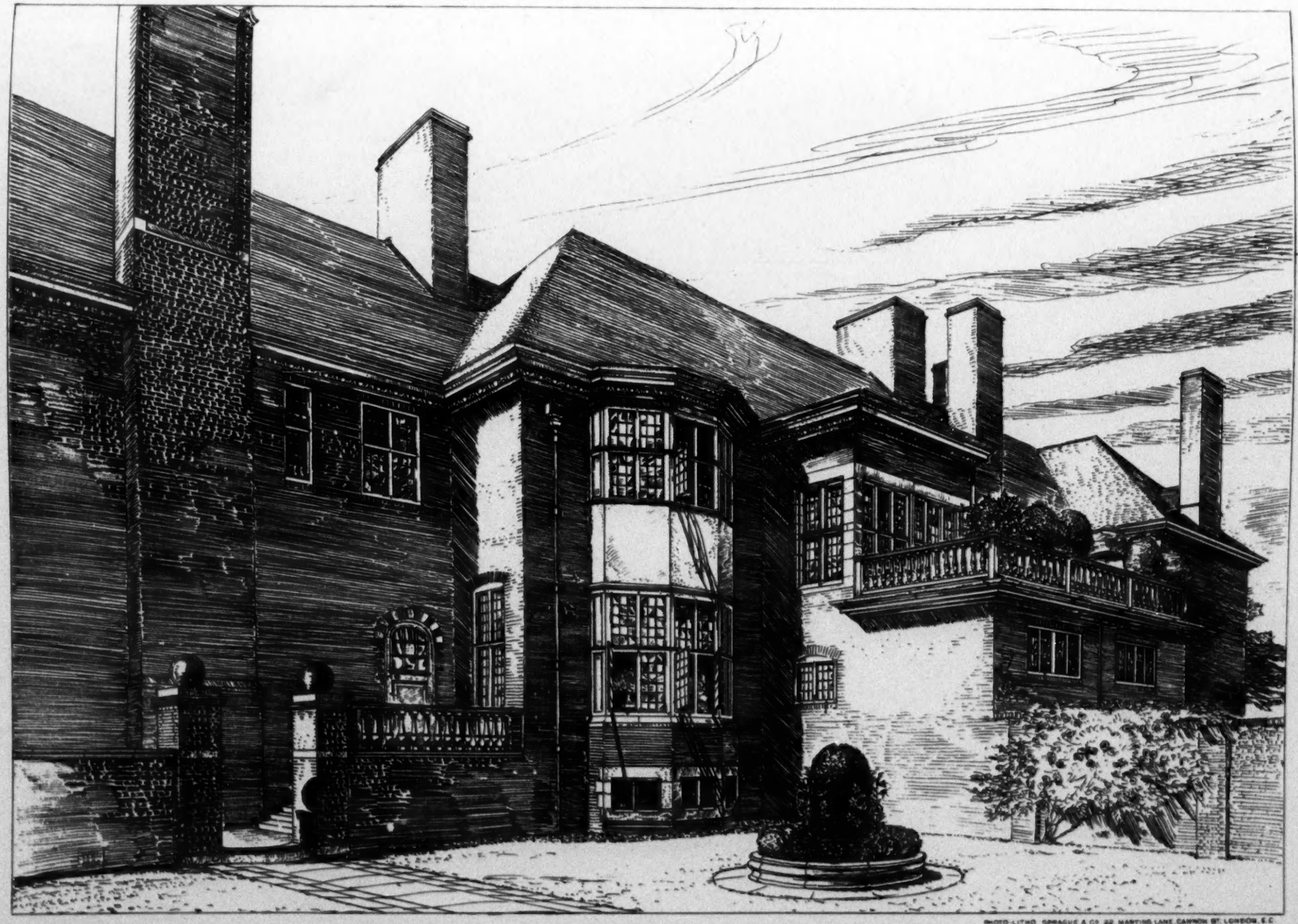


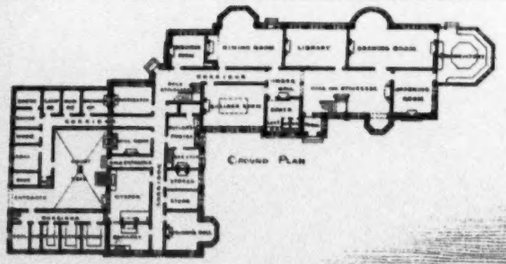
PHOTO-LITHO. SPRAGUE & Co. 62, MARTINS LANE, CANNON ST. LONDON, E.C.

Royal Academy Exhibition, 1890

BULLERS WOOD, CHISLEHURST.—Mr. Ernest Newton, F.R.I.B.A., Architect.

A Country House.

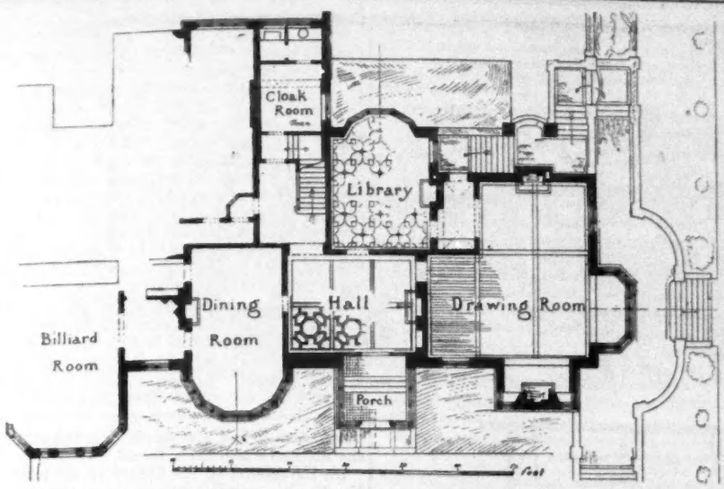
Louis Ambler, ARIBA, Architect.



Ground Plan

View of Entrance Front

Photo-Litho. Sprague & Co., 52, Martins Lane, Cannon St., London, E.C.



Plan of Bullers Wood, Chislehurst.

terrace on the east, with brick walls and stone steps and balustrades.

The house is lighted throughout by electricity. This is generated on the spot, engines and dynamos being in duplicate. The chief electric fittings are designed by the architect, and made by Messrs. Shirley & Spence, of Rathbone-place.

The builders are Messrs. Arnaud & Son, of Bromley; electrician, Mr. Drake (working under Messrs. Lea & Thornbury, of Birmingham); the plumbing was done by Messrs. Mathew Hall & Co.; the windows and casements by Messrs. Wenham & Waters; the hot-water supply by Messrs. Longden & Co.; the ceilings by Messrs. Jackson; floors by Messrs. Arrowsmith; and the wood-carving by Mr. Knox. Mr. Thomas Spooner was clerk of works.

The architect was Mr. Ernest Newton. The drawing from which the illustration is taken was exhibited in the Royal Academy of this year.

COMPETITION DESIGN FOR SHEFFIELD MUNICIPAL BUILDINGS.

THE perspective drawing of this picturesque design, by Mr. B. Woollard, was exhibited in the architectural room at the Royal Academy this year.

The designer has not been able to furnish us with a plan, and we give the drawing merely as a specimen of architectural design for a special site.

DESIGN FOR A COUNTRY HOUSE.

WE do not usually publish designs which, as we take this to be, are for imaginary buildings only; but the geometrical elevation of this was accepted at the last Royal Academy Exhibition as an example of domestic architecture, and we therefore give it a place in our plates, accompanied by the perspective view which further illustrates the design.

Without exhibiting anything strikingly original, the design has the merit of simplicity and suitability for its purpose, and a certain amount of character and expression is given to the exterior by the arrangement of the windows in reference to the apartments they give light to. The placing of the hall and staircase windows shown in the perspective view is especially a good point in the design.

The author is Mr. L. Ambler, architect, of London and Brentford.

COMPETITIONS.

NEW BUILDINGS, SUNDERLAND.—We are informed that the plans of Mr. T. R. Milburn, A.R.I.B.A., have been chosen by the Sunderland Corporation, in an open competition, for restaurants, shelters, cafés, shops, concert hall, and public cloak-rooms, to be built on the Lower Promenade at Roker.

WHITEFIELD'S TABERNACLE. — Professor Roger Smith has issued his report on the designs submitted for the rebuilding of Whitefield's Tabernacle in Tottenham-court-road. The report recommends the design signed "Winged Heart" for the first premium, and that signed "Lux Mundi" for the second. The former is by Mr. F. Boreham, the latter by Mr. J. M. Brydon. Ten designs were sent in.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS:

VISIT TO EDINBURGH.

THE Association of Municipal and Sanitary Engineers and Surveyors held a two-days' meeting at Edinburgh on Friday and Saturday of last week, under the chairmanship of their President, Mr. H. P. Boulnois, City Engineer of Liverpool.

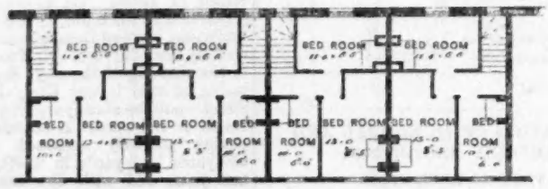
On Friday forenoon a meeting was held in the hall, 117, George-street, when two papers were read,—one by the Burgh Engineer of Edinburgh (Mr. Cooper) on "Municipal Work in Edinburgh," and the other by Mr. W. N. Colam on "The Cable Tramways of Edinburgh."

In his paper Mr. Cooper first welcomed the Association to the city, and pointed out how by the formation of County Councils an opportunity was presented for the inauguration of a new era of sanitary work. Passing on to deal with municipal work in Edinburgh, he called attention to several facts to show that the city itself was about to begin a new history. These facts were the completion of the Forth Bridge, by which the city had become an emporium of traffic, and increased railway accommodation had been made necessary; the acquisition of the gas supply, and the intended acquisition of the horse tramways, the proposed increase of the water supply, and the application to Parliament for powers to better deal with various local matters. As to the municipal work of the recent past and the present, Mr. Cooper explained first the Chambers Improvement scheme, and the system of sanitary administration in relation to infectious disease. On the authority of the Medical Officer of Health it was known, he said, that the zymotic death-rate had decreased from 3·33 per thousand of the population in the period 1870–79 to 1·82 per thousand of the population in the period 1880–89. The Public Health Committee, he also said, had for several years maintained a spirited oversight of the poorer districts of the city, although the mortality and infectious disease statistics showed that there was much yet to be done before all sources of physical, if not moral, deterioration were rooted out. The following particulars would give an idea of the amount of work done in this direction:—Number of uninhabitable houses dealt with during the last five years, 2,000; number of houses closed as being uninhabitable, 1,006; number of tenements of houses where water-closets have been introduced by order of the authorities, 1,100; number of sinks introduced by order of the authorities, 650; number of tenements where the drains and sanitary appliances have been overhauled and put into good order, 3,400; all the work at a cost to the owners of 57,000*l*. He was strongly of opinion that the condition of the slums and poorer districts of a city was a very fair measure of the extent to which its civic rulers and officials were conscientiously alive to their duty. The lines of action followed by Edinburgh, to which he had referred, might not have been pursued so actively as was desirable, but the plan of her action was intelligible, and the results had been so far satisfactory. An experiment had been made with one small scheme of model dwellings for the very poor, containing some thirty-three houses, with rentals from 6*l*. 10s. to 9*l*. It was situated in the West Port, a district where such accommodation was much required, but the cost of acquiring the site had handicapped the scheme itself, and entirely prohibited any further effort in the same direction. On the question of the duty of a local authority to provide suitable dwellings for the poor, there was in Edinburgh considerable diversity of opinion, and serious opposition by the Magistrates and Council themselves. The Society would confer a boon upon the citizens should they shed light upon this subject. Mr. Cooper next called attention to the system of inspection of the drainage and sanitary appliances of houses and buildings, and paid a tribute to the Dean of Guild Court work of the late Sir James Gowans, whose memory, he said, inspired them still. He then explained the sewerage system of Edinburgh, mentioning also the new scheme for the purification of the Water of Leith. He afterwards alluded in succession to the roads, streets, pavements, and footpaths, quoting from information supplied by the City Road Surveyor (Mr. Proudfoot), and also to the cleaning of the city. Regarding Princes-street, he said it was likely the whole of that street would be shortly repaved in wood—either beech or red-wood. A stretch of beech-wood paving properly seasoned and creosoted, 250 yards by 8 yards in width, was laid down last year, and with the exception that it became very slippery during wet, frosty, or muggy weather, and required to be kept exceptionally clean, and occasionally sprinkled with sand or fine gravel, it was giving satisfaction. As to the re-paving of the street, of course the old concrete foundation remained good, reducing the cost of re-paving to that extent; the cost of the beech-wood paving, not including the concrete bottom, was 10s. 4½d. per superficial yard. As regarded wood paving otherwise, he confessed that Edinburgh had never given this kind of paving fair play. At the present time they had only two or three short streets, where noiselessness was of first importance, paved with it. At the beginning of the era of wood paving they did try it on one or two of the busy thoroughfares, but as the wood blocks were simply laid on the original criss-cross wooden boarding, a seven years' trial was deemed sufficient, and they again fell back on the whinstone setts. Mr. Cooper closed by giving a short *résumé* of the powers as to the formation of streets and the erection of houses which the Corporation proposed to submit for the sanction of Parliament next session.

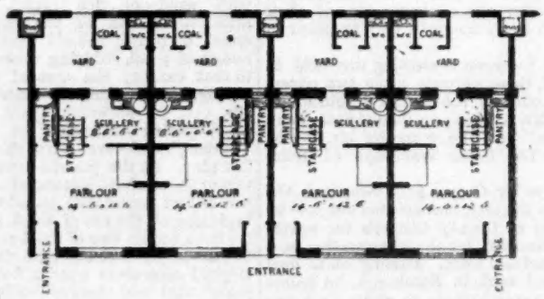
Mr. Colam, in his paper, first spoke generally of the development of the cable tramway system, and then in detail described the Edinburgh system. He mentioned a number of the facts which were contained in his paper recently read before the British Association.* Alluding to the question of speed, he said an application had been made to increase the speed from six to eight miles per hour. It seemed manifestly unfair they should not be allowed to increase the speed, because steam tramways were now worked with loads of twenty tons behind them down inclines of 1 in 14, with really practically nothing like the control that the cable car had. The cable car had two complete and distinct sets of brakes in case it was entirely disconnected with the cable. But, assuming that all the brakes were done away with by some extraordinary mishap, the cable itself would act as a brake for the car, and would prevent the car going at a greater speed than the cable. So that if everything were to go, the car could always return to the speed of the cable, which was limited.

A discussion took place on the papers. The speakers were, the Chairman, Mr. de Courcy Meade (Hornsey), Mr. Edward Pritchard (London and Birmingham), Mr. Charles Jones (Ealing), and Mr. Lobley (Hanley). Mr. Pritchard, in his remarks, said, with regard to paving, he had read in the *Scotsman*, in a statement from a special correspondent, the announcement that one of the ablest Town Councillors of Edinburgh was devoting his time inquiring into the best means of paving; and he (Mr. Pritchard) noticed some remarkable information in that announcement—information which he before certainly was not in possession of, and he rather hesitated now regarding it. He wished to point out, however, that wood-paving in its best form was a luxurious

* See *Builder* for September 13, p. 206.

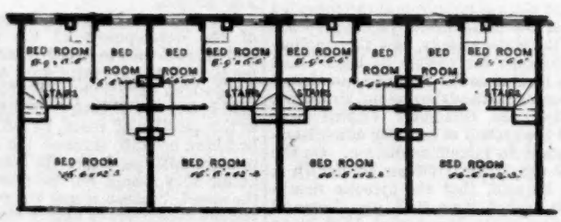


A FIRST FLOOR PLAN containing 3 BED ROOM

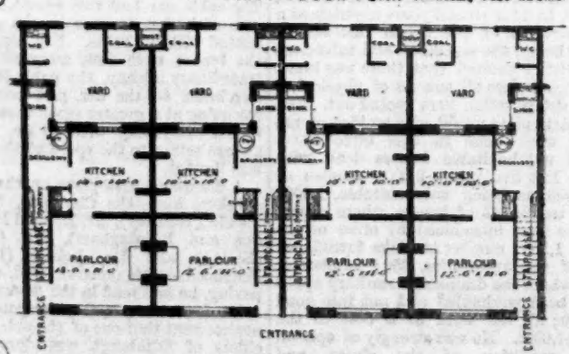


A GROUND PLAN containing PARLOUR SCULLERY PANTRY &

EACH HOUSE TO COST £165



B FIRST FLOOR PLAN containing 5 BED ROOMS



B GROUND PLAN containing PARLOUR KITCHEN SCULLERY PANTRY &

EACH HOUSE TO COST £200

Schemes for Workmen's Dwellings, for the Rev. Arthur Robins, M.A., of Windsor. Messrs. R. Knill Freeman & S. Denison Robins, Architects.

paving, but it had not the life that the writer of the *Scotsman* told them it had.

On the motion of the Chairman, seconded by Mr. Meade, a cordial vote of thanks was passed to Mr. Cooper and Mr. Colam for their papers. The vote was suitably acknowledged.

The members afterwards, under the guidance of Mr. Colam, inspected the cable tramways system and depot. They lunched with the Town Council, and in the afternoon visited the Exhibition. In the evening they dined in the Royal Hotel.

On Saturday the party visited the Forth Bridge, and inspected the Craigintinny Meadows and the Water of Leith works.

DWELLINGS FOR THE POOR.

The Rev. Arthur Robins, of Windsor, who has taken such a deep interest in the great question of the better housing of the poor, read a paper on this subject, by the invitation of the Archbishop of York, at the Hull Church Congress on the 30th ult. He proposed to show that "human homes" for the poor can be built so as to pay, and to this end he produced a practical design for working-class dwellings, by Messrs. Knill Freeman & Denison Robins, architects, Newcastle-upon-Tyne. It has always been urged as an excuse for doing nothing that it will never pay to build decent dwellings for the poor. By means of the plans which we publish in our issue of to-day, the Rev. Arthur Robins undertakes to demonstrate that not only is it a Christian duty to give "human homes" to all our poor, but that the duty can be so discharged as to become a remunerative transaction, and that such dwellings can be built so as to produce, at a moderate rental, a very fair return upon the outlay.

THE LONDON COUNTY COUNCIL.

The London County Council held its first meeting since the Autumn recess on Tuesday last, the Chairman, Sir John Lubbock, presiding.

Open Spaces in St. Pancras.—Paragraph 8 of the Parks' Committee's report of July 29, which was adjourned over the recess, was as follows,—"On June 24 last we reported that the Vestry of St. Pancras had asked that a sum of 1,500*l.* might be voted to them out of the 12,000*l.* paid by the Midland Railway Company for the acquisition of new or the improvement of existing open spaces in the parish. This sum of 12,000*l.* was paid by the Railway Company as compensation for a portion of the recreation-ground on the improvement of which the Vestry desire to expend the 1,500*l.* The improvements consist in the building of a keeper's lodge; the draining of the ground, and the sloping of it towards the adjoining roadway; and providing a greenhouse, urinals, iron gates, new railings, stone steps, &c. We considered that the Council might properly, under the circumstances, make the contribution asked for, and we so reported, but the recommendation was subsequently withdrawn in order that the wording of it might be amended. We now recommend,—

'That the Council, subject to an estimate being submitted to it by the Finance Committee, as required by the statute, do contribute a sum not exceeding 1,500*l.* towards works of improvement at the recreation-ground in St. Pancras-road, such money to be taken, not out of the rates, but out of the 12,000*l.* recently received by the Council from the Midland Railway Company, and be paid to the Vestry on a certificate by the Comptroller and the architect respectively, as to the expenditure of the money and the carrying out of the works.'"

After a long discussion on an amendment by Councillor Dickinson, who wished to see the money applied to the acquisition of new spaces rather than to the improvement of existing ones, the recommendation was adopted.

The London Water Supply.—The consideration of the following report of the Special Committee on Water Supply had also been deferred from July 29. Councillor Beal now brought up the report, which was as follows:—

"It will be within the recollection of the Council that the General Powers Bill contains a clause for authorising the Council to prosecute and conduct inquiries and negotiations relative to the supply of water, or to companies supplying water, and relative to markets in or near London. The Bill has passed the Commons, and is now in Committee in the Lords. Should it become law,* it will be desirable for many reasons to enter upon the inquiries with the least possible delay, and it may even be necessary to commence them before the meeting of the Council after the recess. To enable us to do this it will be necessary for the Council to pass a resolution authorising us to undertake the inquiries, and we therefore submit the following recommendation:—

'That, *in the event of the necessary power being*† given by Parliament, the special Committee on Water Supply and Markets be authorised to prosecute and conduct enquiries and negotiations relative to the supply of water, or companies supplying water, or relative to markets in or near London, provided that the cost of such enquiries do not exceed the limits imposed by the section authorising such enquiries and negotiations.'

Before entering upon the inquiry relating to water, referred to in the preceding paragraph, we think it will be desirable to approach the water companies with a view to ascertaining whether it would be possible for the companies and the Council to make some provisional agreement as to the terms upon which the companies' water undertakings should be transferred to the Council if Parliament gives the necessary authority. If some such arrangement as this were made, it would save great delay and expense, and we think that the Council should endeavour to provisionally agree upon terms with the water companies. We therefore recommend—

'That the Committee be authorised to enter into tentative negotiations with the water companies for the purpose of ascertaining upon what terms the companies will be prepared to dispose of their undertakings to the Council in the event of Parliament empowering the Council to acquire such undertakings.'"

These recommendations led to a long discussion, but they were eventually adopted, with certain verbal amendments, by 58 votes for to 37 against; majority for, 21.

The Sewage Question.—The Main Drainage Committee presented the following report:—

"Your Committee regret that the report of Sir Benjamin Baker and the Chief Engineer cannot be presented to the Council before the end of the year. Sir Benjamin Baker has been called by other pressing engagements to America, and will not return until early in November. Meanwhile your Committee have received from the Chief Engineer a report stating, on behalf of Sir Benjamin Baker and himself, that 'it would tend greatly to a more perfect understanding of the case, add greatly to the certainty and accuracy of our recommendations, and to any future action on the part of the Council, if some reliable tidal float experiments could be made in Sea Reach, below the Mucking Light, in the direction of Canvey Island, the Chapman Light, and the Nore,' recommending the employment of Mr. C. J. Woods, M.I.C.E., and expressing the opinion that the cost for the required two months' observations would amount in all to about 300*l.* Your Committee therefore recommend—

'That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, an expenditure not exceeding 300*l.* be sanctioned for all costs in connexion with making the proposed tidal float experiments in the lower part of the Thames.'"

"With reference to the new 4-in. cast-iron water main pipes ordered by the Council on June 24 to be laid from the Manor-road, East Ham, to the Barking outfall, an error was made in the Engineer's department in the estimate of length, and your Committee are now informed that an additional sum of 300*l.* will be necessary to complete the main pipes required. They recommend—

'That, subject to an estimate to be submitted to the Council by the Finance Committete as required by the statute, an additional sum of £300 be sanctioned in respect of the cost of the new 4-inch cast-iron main to be laid from the Manor-road, East Ham, to the Barking outfall, for the purpose of conveying a proper supply of water to the works, the work being carried out under the general contract.'"

"Your Committee have received from several parts of the County of London various complaints of recent flooding, to which in all directions they are giving their best attention. Measures of relief have been already sanctioned by the Council for the repair and enlargement of the Abbey-mills Pumping-station, for the construction of an important relief sewer in Hackney, for new works in connexion with the Isle of Dogs Pumping-station, &c. Among the cases of complaint on the south side of the river is one as to works near the "White Horse," in Brixton-road, where some very complicated trough-weirs were built by the Metropolitan Board of Works, with a view of carrying off storm-water from the Effra sewer. Your Committee, upon a report from the Engineer, recommend,—

'That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, the expenditure of a sum not exceeding £150 be sanctioned for the proposed alteration, including the removal of these cast-iron troughs and the building of a brickwork weir 95 ft. in length.'"

"The attention of your Committee has been directed to the necessity of reconstructing the Council's 5 ft. by 4 ft. sewer in Upper North-street, Poplar. The Engineer reports that this sewer, which is about sixty years old, has holes in its invert from 50 ft. to 100 ft. in length, which are about 12 in. below the proper level, and that its bad gradient has, he is informed, long been the cause of much trouble and expense in clearing out the deposit. He states that if the sewer were reconstructed, a fall of about 20 ft. from Northumberland-street, where floodings have been of frequent occurrence, could be obtained, and that considerable relief would doubtless be afforded to the whole district (about 1½ square miles) draining into the sewer. As a remedy, the Engineer reports it would be requisite to construct a new 4 ft. by 2 ft. 8 in. brick sewer in substitution for the existing one in Upper North-street, Poplar, from the Limehouse Canal to the sewer in High-street, Poplar, a distance of about 800 yards, at an estimated cost of about 6,000*l.* Your Committee has considered these reports, and recommend—

'That, subject to an estimate to be submitted to the Council by the Finance Committee, as required by the statute, the execution of the above-mentioned work be sanctioned; that the specification be printed, and that an advertisement be issued inviting tenders for the construction of the proposed sewer.'"

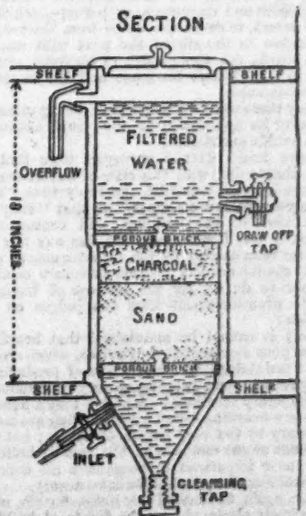
These recommendations were all agreed to, and after the transaction of a great deal of other business, the Council adjourned.

* It has become law since the date of the Report.—Ed.

† The resolution, as now moved and adopted, contains the words "the necessary powers having been," in lieu of those italicised.

THE "LITTLE FOUNTAIN" FILTER.

This is a form of filter patented by an architect, Mr. Fogerty, the working of which is sufficiently explained by the section. The



The "Little Fountain" Filter.

object is to provide a filter for drinking-water connected with the house service, which requires no filling by hand, the water percolating upwards under the pressure from the service-pipe, and being always ready for use. The patentee writes:—

"It is a domestic filter, intended for the pantry, and is fixed between two shelves at about 18 in. apart. It is connected to the main water-supply, or to the supply-tank, and gives a constant flow of water. It is intended to obviate the trouble and inconvenience of having to fill the ordinary type of filter, and as the water is kept constantly running, no stagnant water accumulates or remains in the filter,—a too common complaint in other filters. As the filtering media are composed of ordinary wood charcoal and clean silver-sand, it is a simple matter to renew them when required, thus materially lessening the expense, as it is found in practical working that the carbon blocks used in some filters become clogged, and require to be constantly renewed."

Correspondence.

To the Editor of The Builder.

AN "EMPLOYERS' UNION."

Sir,—Referring to a letter in your issue of the 20th ult., signed "Contractors," will you allow me to state that this Association fulfils, as regards builders and contractors, all the requirements of your correspondents?

With reference to the ancillary trades I may mention that since this Association was originally founded, in 1872, the members of these trades, with some few exceptions, have always refused to render us any assistance in times of trial.

I have no doubt that, if proper representations were made to my Committee, they would consider the advisability of admitting the allied trades.

I may also mention that this Association is affiliated to the National Association of Master Builders of Great Britain, as well as some other local Associations in between forty and fifty of the principal towns in the country.

E. S. Henshaw, Secretary.
Central Association of Master Builders,
31 and 32, Bedford-street, Strand,
London, October 1, 1890.

Sir,—I have been away, so did not before see your number of September 20.

I observe there is no date to the letter signed "Contractors."

Surely, it must be an old letter, written twenty years ago and crept into your columns by mistake.

If your correspondents are English contractors, what could they be about or where do they come from not to have heard of the Central Association of Builders, which was established in 1872 for the purpose proposed by them.

I suppose "Contractors" never heard of the 1872 and 1877 strikes!

October 1, 1890. Stanley G. Bird.

**** We read the letter in question with some surprise, but we presumed that the writers, a large and well-known firm, had their own reasons for wishing for a new departure.—Ed.

TRADES UNIONS AND THE BUILDING TRADES.

Sir,—Seeing that considerable prominence has been lately given in the columns of the *Builder* to the sayings and doings of the late Congress of the Trades Union delegates, I am constrained to ask what on earth has the congress, or the unions either, to do with the building trades? or, rather, what right have they to assume the authority to speak for those trades when by the utmost stretch of imagination it cannot be said they are in any sense of the word representative of any one particular branch?

Take, for example, the "Carpenters and Joiners," one of the most important, I should say, as to numbers. I take their own words for it, when I state the union does not represent a tenth part of the whole body.

At a meeting which took place a few Sundays ago on Clapham Common, one of the speakers is reported to have said, when calling upon those present to join the union, "that in London alone there are 30,000 of this class of workmen. Yet there are only 3,000 out of the whole lot that were unionists."

Again, in regard to the bricklayers, of whom it was said many years ago the metropolis contained upwards of thirty thousand, a number which by this time must be considerably augmented, I was informed only a few days ago that, taking all England together, about six thousand were members of the union. Now, without going further, I think it must be admitted that, in relation to the unions,

these two branches may be taken as fairly typical of the remainder.

It may perhaps be said that, if not in point of numbers, the Union is representative in the sense that its members are the *élite* of the several trades. This I flatly deny, for the proportion of mediocrity, as against superior skill, is, I know, as great inside as outside the Union.

Now, Sir, taking the foregoing statement to be in the main correct, which I maintain it is, I ask am I not justified in my contention, that whatever may be the case with other industries, in so far as concerns the building trades, the union is not representative, and, therefore, has not the slightest claim to arrogate to itself the right to dictate the terms, either as to hours, wages, or methods, by which those trades are to be regulated?

One word more: Mr. Burns himself at the Congress acknowledged that to a million and a-half of Unionists, meaning all classes combined, there are seven millions unorganised (*vide Daily Telegraph*, September 5).

Now, while granting to the million and half the full right to combine, to which they are, undoubtedly, entitled—surely, the seven millions have an equal right, if they choose, not to combine. Herein lies the pith of the whole question.

A Lover of Fair Play.

THE CONVERSION OF TIMBER BY MACHINERY.

Sir,—I agree with the remarks of Mr. S. Worssam in your issue of Sept. 20, that the merits of the band-saw for converting heavy logs are not properly appreciated in this country. Circular-saws for breaking down heavy timber, when compared with band-saws used for the same purpose, possess the advantages of a greater out-put, a somewhat lower first cost, and are perhaps a little easier managed. On the other hand, a well-designed and managed band-sawing machine uses much less power and wastes less wood—at the same time the cut is cleaner. In converting valuable woods, this waste is a matter of great importance, and even if mill-saws are used, unless it be a single one, the band-saw possesses the advantage of enabling the operator to examine the figure of the wood as the sawing progresses, and, should unsoundness be detected, the log may be cut into scantling, or be otherwise more usefully converted.

In America, where inserted teeth are largely used, the saws are of much thicker gauge than ours, consequently the saving in power and wood through using a band-saw is correspondingly greater. It may be of interest to your readers to compare the output of circular and band-saws as used in America. The average output of a first-rate circular-saw, cutting pine, may be set down at about 40,000 ft. per day of ten hours, whilst a band-saw in the same time would produce about 30,000 ft. An American authority, in comparing circular and band-saws, says "that the kerf of circular saws averages 5-16 in., and in sawing 1,000 ft. of inch boards, 312 ft. is turned into sawdust. The average kerf of the band-saw is about 1-12 in., and in sawing the same amount of boards it turns 83 ft. into sawdust. This shows a clear saving of 229 ft. in favour of the band-saw on every 1,000 ft., and on every 1,000,000 ft. of 229,000 ft."—an enormous saving to say the least. The figures given must, however, be very considerably discounted when applied to this country, as the saws in use here are of much thinner gauge, but supposing a reduction of 50 per cent., and the saving is still very great.

I take it three of the chief reasons for large band-saws failing are the employment of blades of too thick a gauge, and allowing them to run over saw-wheels of small diameter, consequently the arc of contact of the saw and wheel is too acute, and cracks are set up at the roots of the teeth which end in fractures. Another reason is that sufficient attention is not given to guiding and supporting the blade as it enters and leaves the cut, and so enabling it to saw in a true vertical line. The writer has overcome this difficulty in a simple manner, and would have no objection to communicate the plan to anyone especially interested. On a well-constructed machine, good saw-blades may with safety be run considerably quicker than the speed given by Mr. Worssam; but it should be regulated by the diameter of the saw-wheel and the nature of the wood being cut. A short saw running over medium-sized wheels cannot, with safety, be run so fast as a long saw running over large ones by several thousand feet per minute. The diameter of the wheels should be in proportion to the thickness of the log sawn, varying from 6 ft. to 12 ft. diameter, the speed of the saw varying in ratio 5,000 ft. to 10,000 ft. per minute. I have found for all kinds of band-sawing a *thin* gauge saw will stand better than a *thick* one.

M. Powis Bale,
Author of "Wood-working Machinery,"
"Saw-mills," &c.

Appold-street, E.C., September 22, 1890.

"A SANITARY NOTE FROM GREENOCK."

Sir,—I shall be obliged if you will permit me a little space to answer Mr. Buchan's letter in your last issue, wherein he criticises some remarks in my former letter to you.

Mr. Buchan seems to consider the chief object of a syphon to be to exclude rats from a house drain. If this be so I agree with him that it answers its purpose fairly well, but I fail to see that this is a matter of importance, because rats cannot do any harm to the drain, and from one which is properly constructed they cannot get out into the house. Rats do not much frequent pipes where they can get into a brick sewer.

I am sorry that Mr. Buchan should not believe that the air in sewers is less impure than in house-drains in most cases, but as a matter of fact it is so. The flow in sewers is continuous, as I pointed out in my previous letter, consequently the soil is always covered with water and moving forward; in a house-drain it seldom happens that one discharge of a closet will put the solid matter into the sewer, the water runs away, leaving the solid in the drain, the next discharge taking it a little further, and, if the drain be a short one, perhaps into the sewer; if not, it may wait for a third or fourth flush of water, but suppose no sink or bath water to have been used between these times there will be several deposits of soil left uncovered by water in the house-drain. This is principally due to the use of water-waste preventors.

As to Mr. Buchan's idea of fever being communicated from one house to another, I see no fear of this, the quantity of water used in a sewer being sufficient to keep fever germs under; moreover, when there is no intercepting trap or syphon between the house-drain and sewer, the closet having a proper trap, the sink, bath, and stack pipes discharging on trapped open receivers, and the soil-pipe being ventilated, there would be no danger of fever germs entering the house from the drain.

I am still of opinion that the air in a house-drain—disconnected from the sewer by a syphon and with the fresh air inlet carried up to the top of the house—is practically at a standstill. What effect does temperature have on this drain? It is like the letter U, both extremities being brought up to the same level, they are in the same temperature and pressure of atmosphere. Many people who, to use Mr. Buchan's words, "ought to know better," entertain the most ridiculous theories on the question of sewer ventilation. No doubt many of these theories are mathematically correct, but unfortunately they do not obtain in practice, and it is no use basing a system of drainage on theory without practical knowledge. Regarding cowls, I have no faith in them. As they are dependent on wind for their action they are worse than useless when there is not sufficient wind to work them, and when there is much wind they are least wanted, as the current of air in sewers is always greatest when the wind is high.

Ernest Van Putten,
Assoc.-Memb. Inst. C.E.

Lewisham, September 27, 1890.

"DANGEROUS ADVERTISEMENTS."

Sir,—The question raised by your correspondent, "An Architect," is a very important one both for the architectural profession and the public.

An architect often feels aggrieved when he is ordered to set back his window-frames, or rip off a small moulding, with, perhaps, a ¾ in. projection, because it is within 4½ in. of the face of the wall; but, on reflection, he knows that in making such a requisition the District Surveyor is only doing his duty. It is a matter for surprise, however, when he finds his next door neighbour is allowed to cover his whole house with matched-boarding, and then proceed to deface it with advertisements which are both hideous and dangerous, or perhaps, which is nearly as bad, to cover the space from the head of one window to the sill of the next with wooden notice boards, the whole width of his front, setting forth in huge letters his name and the merits of his various wares.

Surely there must be something wrong either in the Act or its application to allow such a state of things as this to continue.

I have heard district surveyors urge that on attempting to deal with this class of advertisement they are at once met with the reply that "they are only temporary erections," or that "they are not a part of the building, and consequently exempt"; but I would ask, Sir, has any fair test case ever been carried to the superior courts, and, if not, should not the district surveyors combine together to do so, for the purpose of having a definite pronouncement from the judges on the question?

Surely it cannot be maintained that boardings such as your correspondent describes, which are put up and maintained for the purpose of producing a yearly rental,—and do produce a very large rental,—are temporary erections! A notice that a house is to let or a hoarding round a new building are clearly temporary by the very nature of things; but such boardings as one now sees on the face of buildings in or near important thoroughfares all over the metropolis are in quite a different category.

Then, again, to contend that notice-boards, which are so freely plastered over the fronts of buildings in all directions, are not part of the building when they are fixed to it by iron holdfasts is manifestly absurd. A tenant erects some fitting for his own convenience *inside* his house and fixes it to the walls; this is held to be part of the house and becomes his landlord's property at the termination of his lease, unless otherwise agreed. In what respect does a fitting fixed *outside* the house, also for the tenant's convenience, differ from that inside? Surely this must also be part of the building.

The matter resolves itself into this:—Are these notice boards and advertisement hoardings infringements of the fourteenth section of the Building Act or are they not? If they are, why is the law not enforced? If they are not, should not representations on the subject be made to the County Council to induce them to take steps to amend the Act?

"Another Architect."

London, September 27, 1890.

WHITEFIELD TABERNACLE COMPETITION.

Sir,—From the report of Professor Smith, the assessor in this case, he appears to have given the first premium to a design, "Winged Heart," which has exceeded the frontage to Tottenham Court-road by some 6 ft. above what was shown by figures on the site plan issued to competitors. As one who kept strictly to those figures I should like to know by what authority "Winged Heart" adopted a greater frontage. The assessor also states that "Lux Mundi" has done the same thing, which he notices "with regret, but thinks it does not infringe the spirit of the instructions;"* and, in commenting on "Hearing and Seeing," he speaks of it as having encroached upon the side land for steps and areas. This seems contradictory, as he sanctions it in the two designs referred to.

Every one knows that where figured dimensions are given they are to be adhered to, unless competitors are told to check them, of which nothing was said in these instructions; and we all know, in a restricted site, how an extra 6 ft. makes all the difference in planning; and in this case it was assumed that in fixing the dimensions the Committee had some special reason for not giving what may, or may not, be the actual available frontage.

This was the view I took, and also seven other competitors. I therefore protest against the award, solely on the above grounds, and maintain that "Winged Heart" was disqualified, and that the premiums should have been awarded to the two best designs which had adhered to the instructions.

A Competitor.

SCALE RULES FOR ORDNANCE MAPS.

Sir,—The use of Ordnance maps has now become so general that it would be a great boon if the mathematical instrument-makers made a pocket rule, on the inside bevelled edges of which were 1 in. and 6 in. to a mile, and the $\frac{1}{500}$ and $\frac{1}{1000}$ scales. This arrangement would occupy one side of the rule, and the other could be utilised by the most commonly used scales—viz., $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, and 1 in.

Should chain scales be needed, they could be placed on the flat part of the rule, or on the edge at the back of the bevelled ones.

The great need, however, is the handy reference to the "Ordnance scales" on the pocket rule.

James Jerman, F.R.I.B.A.

The Student's Column.

HOT-WATER SUPPLY.—XIV.

COVERING PIPES AND RESERVOIRS FOR THE CONSERVATION OF HEAT (*continued*).

A METHOD sometimes adopted for covering outside pipes is to run them within a larger pipe, such as is used for rain water, filling in the intervening space with sand or some other material. This plan is neat and convenient in the first instance, but it is very disadvantageous should a leakage occur, when it becomes necessary to displace most of the large pipes, or to break out one of the lengths.

There are various materials in the market prepared and sold expressly for covering heated surfaces to prevent radiation and loss of heat; these generally take the form of a cement, and are largely used for coating steam-boilers and tubes in which conservation of heat is so very necessary; but these materials have not been taken to at all favourably by hot-water engineers. No doubt the chief reason is that they are a little difficult of application compared with felt and some other substances, and with these latter there is less trouble occasioned should it be necessary to expose and afterwards re-cover the pipes.

There is a material deserving of special mention on account of its excellent qualities, and which is used alike by steam and hot-water engineers. This is "slag wool," a material obtained as a waste product from blast furnaces; it is a fine, soft, woolly substance, and an ex-

*Our correspondent is mistaken; the words quoted from the report refer to the design signed "Red Cross."

cellent non-conductor of heat, as it is wholly composed of glass (silica). For packing pipe cases it equals hair, and its cost is very reasonable, being about 12s. per cwt.

Asbestos is, of course, a suitable material for the purpose under discussion, but it is little used in hot-water work, probably on account of its cost.

Sand, where it can be used, is also a poor conductor of heat, as this is chiefly composed of silica, the same as slag wool; but it is not so easy of application as this latter material, which is a woolly glass.

CONVERSION OF A TANK APPARATUS TO THE CYLINDER SYSTEM.

It very frequently happens that when any extensive repair is being carried out, or from some other such cause, it is thought desirable to convert an old apparatus to a more modern system, and the change can usually be effected without very great expense, that is to say, at considerably less expense than erecting a new apparatus.

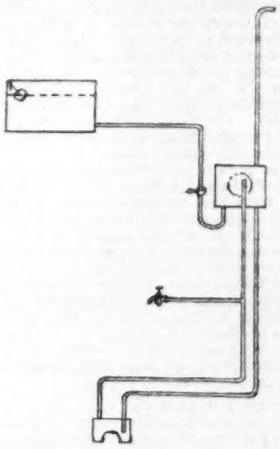


FIG. 28.

The most usual method, when circumstances will allow, is to utilise the existing flow and return pipes of the tank system for the rising main and cold supply to the cylinder, respectively. Fig. 28 shows a small, ordinary style of tank apparatus, and fig. 29 shows the same

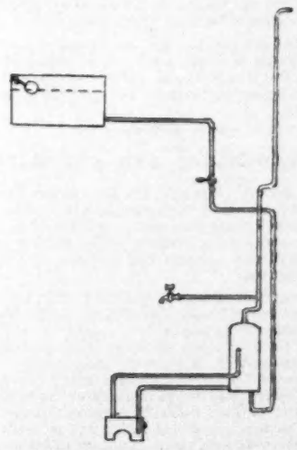


FIG. 29.

apparatus converted. It will be seen that the conversion requires the removal of the tank entirely by this method. The flow-pipe which entered the tank has to be continued up to above the level of the cold-water cistern; the cold supply service which was carried into the tank must be connected on to what was the return pipe, and this completes the alteration at the top of the house. In or near the kitchen the original flow and return services have to be cut, and the cylinder inserted as shown, the flow and return from the boiler being connected into the cylinder in the usual way, the continuation of the flow-pipe has to be connected into the cylinder at the top to form the rising main service, and, lastly, the lower extremity of the cut return pipe (which is now connected with the cold-water cistern at the top of the house) has to be carried into the bottom of the cylinder, forming the cold supply. The stop cock in this service, which we have left at the top of the house, can, of course, remain there, but it is much better to bring it down close to the cylinder, so that when a workman has to use it there is no occasion for him to traverse the house three or four times, certainly twice.

The alteration at the top of the house can be lessened if desired by the non-removal of the tank, this article being left to increase the cold water supply; in this case the only change to be effected at the top of the house is to convert the flow-pipe into a rising main carried to above the level of the cold cistern, as Fig. 30.

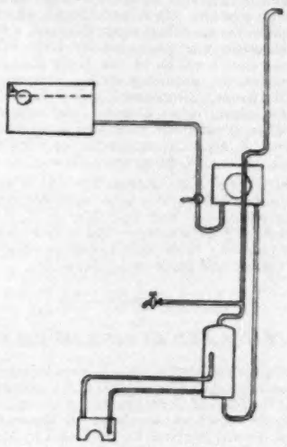


FIG. 30

It will be noticed that the conversion described (Fig. 29) does not provide for the rising main being returned; this, if it is necessary, must be a distinct and new service, and it becomes a necessity should there be any draw-off services that were "returned"; as otherwise there will be no service-pipe to return them into. This brings to notice the only disadvantage of the cylinder system, which is that a good and complete apparatus has to have three pipes down the house, whereas the tank system needs only two; but after all the difference is not so very great, as the pipes above the cylinder

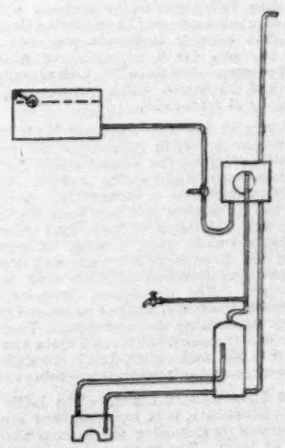


FIG. 31.

do not require to be so large as the flow and return of a tank apparatus.

Sometimes the conversion can be effected without interfering with the tank at all, but the circumstances have to be rather special. As an instance, let it be supposed that the existing tank system which is to be converted has a tank, say 25 or 30 gallons, which has proved to be rather insufficient for the demand; or supposing the demand for hot water has increased and a larger kitchen range or a larger boiler is being introduced, then in either of these instances, instead of taking away the tank, it can be allowed to remain and a small-sized cylinder inserted below, as fig. 31, it being arranged for the contents of tank and cylinder together to be, say, 55 to 60 gallons, if the range is of fair size, or according to the general requirements.

This arrangement can be but seldom resorted to, as most usually the tank will be found of ample size, and capable of fulfilling the demand, in which case to insert an additional reservoir would in all probability be more than the boiler could heat successfully, and a limited success in this work may be considered a failure.

The illustration shows exactly what is necessary in a conversion of this character. There is no alteration whatever needed in the upper part of the house, except that it must be seen that the flow-pipe in the tank terminates in a high position, say, within 3 in. or 4 in. of the top, and not on any account near the bottom of it. The insertion of the cylinder below differs a little from the arrangement last explained, as will be seen by comparing the two illustrations, as the original return-pipe still remains a return-pipe, and instead of being connected high up into the side of the cylinder, it must be brought in at or near the bottom, as we cannot look for much hot water in this pipe, and it must be kept away from the draw-off services accordingly.

The following diagram, fig. 27, was inadvertently omitted from its proper place in the last of these articles (p. 251 *ante*).

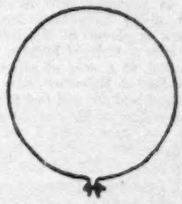


FIG. 27.

GENERAL BUILDING NEWS.

New Mission Church at Landore.—On the 26th ult., Lady Vivian laid the foundation stone of a new mission church at Landore. The building is to be of native stone, rough cast on the outside and plastered to a smooth surface inside, with the chancel arch window and doors of red brick quoins. The nave is to be 60 ft. by 24 ft. 6 in., and is to be entered by a porch. Accommodation is provided for 300, and the contract is for about 600*l*. The work is to be carried out from the designs and under the superintendence of Messrs. J. Buckley Wilson, F.R.I.B.A., and Glendinning Moxham, architects, Swansea. Messrs. Gustavus Bros. are the builders.

New Buildings at the Maidstone Museum.—The formal opening of the new Bentlif wing at the Maidstone Museum took place last Monday. The new building has a frontage to the street of 45 ft., and measures 56 ft. from back to front. On the ground-floor are a reference library 31 ft. by 32 ft. and a room 54 ft. by 20 ft., while the floor above contains two galleries for the exhibition of pictures. The floors throughout are fireproof, and are laid with solid oak blocks. The heating is by hot water, supplemented by fire-places. The work has been carried out by Mr. James Clements and Mr. Henry Brennan, under the direction of the architect, Mr. Hubert Bensted, F.R.I.B.A.

New School Hall, Chingford.—On the 25th ult., a new congregational school hall at Chingford was formally opened. The building has a frontage of 100 ft. to the Buxton-road, and 45 ft. to the Drive, and consists on the ground-floor of a hall 56 ft. long and 29 ft. wide, capable of seating 300 people; two large class-rooms, entrance-hall, and a completely fitted kitchen. The building is faced outside with red bricks and Bath stone dressings, with tiled roofs, and has pointed windows, glazed with lead lights. The hall is warmed by means of Grundy's warm air apparatus. The buildings have been erected from the designs and under the superintendence of Mr. Rowland Plumbe, F.R.I.B.A., of London, by Mr. J. F. Sargeant, of Hackney.

St. Thomas's Church, Stourbridge, was opened last week after additions and alterations. The architects were Messrs. Cotton & Bidlake, of Birmingham.

New R.C. Church for Paisley.—On the 27th ult. the memorial-stone of the new Roman Catholic church being erected at the west end of George-street, Paisley, was formally laid by Archbishop Eyre, of Glasgow. The church is in the Gothic style of architecture, and consists internally of nave with aisles, the nave being divided into six bays, separated from the aisles by octagonal pillars. These pillars are of stone from the Giffnock quarries. There are seven three-light windows in the clearstory, and a similar number of windows in each of the aisles. The organ gallery is being erected at the north end of the church, where also will be the baptistery and the confessionals, whilst the vestry-rooms are on the south side, close to the church. The main window of the nave will consist of five lights 30 ft. in height. The church is being built of red stone from Locharbriggs quarry. Accommodation will be provided for about 900 worshippers, and the cost of the building will be fully 5,000*l*. The architects are Messrs. Pugin & Pugin, of London.

Re-opening of St. Michael's Church, Somerton.—The ancient parish church of Somerton, after complete restoration, was re-opened on Monday last by the Right Rev. Lord Arthur Charles Hervey, Bishop of the diocese. The whole of the roofs of the nave and aisles have been re-leaded, the decayed timbers removed, and new wood substituted. The roof of the south aisle has been almost wholly re-timbered; but the major portion of the magnificently-carved nave roof has been retained. The arcades on the sides of the nave and the piers supporting the arches have been rebuilt, and the whole of the walls have been thoroughly repaired. The floor has been raised to nearly its original height, and covered throughout with a bed of concrete, while upon this solid wood blocks have taken the place of the decayed boards and joists which originally rested on the earth. The old memorial stones in the aisles have been relaid, the gallery has been entirely removed, and an apparatus for heating the church with hot air has been fixed. The ancient ends of the seats in the nave have, as far as possible, been retained; but the seats in the aisles have been modernised. A painted window is placed at the east end of the church at the cost of Colonel Pinney. The chancel has been restored, at a cost of about 700*l*., by the lay rector (the Earl of Ilchester), who employed his own architect and builder, and had the work carried out entirely according to his own ideas. The work of restoration has been carried out at a cost of some 3,500*l*. by Messrs. Merrick & Sons, of Glastonbury, from the plans of Mr. George Vialls.

Residential Flats at Kensington.—The Commissioners of the Exhibition of 1851 having sold the ground immediately in the rear of the Royal Albert Hall to Messrs. Geo. Newman & Co., of Billiter-street, and Deptford, this firm is now erecting on the site, covering an area of four acres, blocks of residential family flats. The plans for these buildings have been prepared by Mr. F. Hemmings, A.R.I.B.A., of 7, Fenchurch-street, E.C. Messrs. Mark Fawcett & Co.'s system of fireproof construction has been adopted for all floors.

Church Restoration at Lydford.—On the 24th ult., the Church of St. Petrock, Lydford, was re-opened for Divine service by the Lord Bishop of Exeter, after having undergone enlargement and restoration. The church is of the thirteenth century, and the present work of restoration and enlargement was commenced in the year 1888, when the chancel was restored. A vestry has since been built, and also a new north aisle. The roof of the church has been restored, new oak timbers having been used. Under the tower arch a new oak screen has been placed. All the flooring of the church has been laid with solid wood blocks, and the plastering has been removed from the walls, which have been re-pointed internally and externally. The windows have been re-glazed, and new stonework inserted where required. The porch has also been restored and paved with granite. The architect is Mr. S. Hooper, of Hatherleigh, and the contractor Mr. William Petherick, also of Hatherleigh. The general carving in the interior of the church has been effected by Mr. Harry Hems, of Exeter. The cost of the work is 850*l*.

New Wing, Suffolk Convalescent Home, Felixstowe.—A new wing to this institution has recently been opened. The new erection, which is for women, occupies the western side of the building, and will accommodate thirty patients. The south front on the ground floor is devoted to two sitting-rooms, and the entire north front is occupied by a common dining-room, capable of dining seventy persons. On the north side and in a separate block are the lavatories, sea bath-rooms, &c. The bath-rooms have the inside walls lined in white glazed tiles, with wood block floors. The baths are in porcelain, with hot and cold sea water laid on thereto. On the first and second floors are dormitories, three on either floor, bath-room, lavatory, &c. The facings of the building are in red brick up to the first floor; above this it is weather tiled. The roofs are covered with Broseley tiles. The total cost of the building will be about 3,250*l*. The work has been executed from Mr. E. F. Bisshopp's designs and under his supervision, by Mr. Thomas Ward, of Felixstowe.

New R.C. Church at Fort-Augustus, N.B.—The foundation-stone of a new church which is to be erected at the Benedictine Monastery, Fort-Augustus, was recently laid by Archbishop Smith of St. Andrews and Edinburgh. The new building will occupy a commanding site immediately adjoining the monastery, and overlooking Lochness and the river Tarff. Designed in the Early English style of architecture, the new church will be about 300 feet in length, and will be connected with the monastery and college by three cloisters. The Abbey Church will provide accommodation for the celebration of the full services of the church, there being, in addition to the main building, the Lady Chapel, the Chapel of the Blessed Sacrament, twelve small chapels, chapter-room, baptistery, and three sacristies. The pile of buildings will be surmounted by a tower rising to a height of 260 feet. The church will be built of grey granite, with free-stone dressings, and the interior throughout, including the groined roof, will be built of Rosebrae stone. The new church is being erected from designs by Messrs. Pugin & Pugin, of London, and is estimated to cost over 60,000*l*.

New Church for Penarth.—The foundation-stone of the new All Saints' Church was laid by Lady Windsor some days ago. The site, situate in Victoria-road, was presented by Lord Windsor. The new church will be of the Early English style of architecture, providing sitting accommodation for 600 persons, and will consist of a chancel, nave, two side aisles, organ chamber, and vestry. The cost of the structure is estimated at 6,000*l*. The architect is Mr. Coates Carter, of Cardiff, Mr. Purnell, of Penarth, being the builder.

Cradley Church, Worcester.—It is reported that Cradley Church has been seriously injured by mining operations, and that Mr. J. M. Gething, architect, of Kidderminster, has been called in to report thereon. It has been found necessary to rebuild vestries and make other alterations.

SANITARY AND ENGINEERING NEWS.

Cleckheaton Sewerage.—We are informed that the Local Board of Cleckheaton have called in Mr. W. H. Radford, of Nottingham, as consulting engineer, to report on a scheme of sewerage and sewage-disposal prepared for the Board by Mr. J. C. Haller, of Rotherham. The estimated cost of the scheme is 20,000*l*.

Whitchurch (Somersetshire) Sewerage.—We hear that the Keynsham Rural Sanitary Authority have instructed Mr. A. P. J. Cotterell, C.E., of Bristol, to report upon a scheme of sewerage to the village of Whitchurch, within their district.

Coventry Water Supply.—The meeting of the Coventry City Council, on the 23rd ult., was largely occupied with the consideration of the Waterworks Committee's recommendation that Mr. Hawksley, C.E., be instructed to prepare plans and specifications for waterworks at Whitley.—The adoption of the report was moved by Mr. Read, who said that while the population of Coventry was increasing, and a water supply of 1,100,000 gallons per day was required, the available quantity fell below the needs. They had Mr. Hawksley's word that in the Whitley Valley was to be found a sufficient supply of good water, and he urged the Council to adopt that eminent engineer's plan and make ample provision for a population of 80,000 or 100,000 persons.—Alderman Maycock seconded the adoption of the report, which was adopted, on a division, by 24 votes to 11.

Progress of the New Artesian Well in the City of London.—With reference to the progress of the work of sinking the artesian well in Petticoat-lane, the acting engineer, on the 23rd ult., reported to the Commissioners of Sewers that during the recess the contractors had not succeeded in removing the substratum of hard stone which was met with, and which was 4 ft. thick. A large staff of men had been employed night and day, and gun-cotton and dynamite had been used, but not efficaciously. The contractors, however, were about to free the well entirely of water, and remove the rock by working on its surface. The depth of well was at present 172 ft., and there was 57 ft. of water in the well. Considering the difficulties of the work, reasonable progress was being made.

Dock Extension at Leith.—The Leith Dock Commissioners have, it is reported, been considering proposals for increasing the harbour accommodation at Leith. The schemes suggested involve (1) the reclamation of the shallow foreshores on the east side of the East Pier, and the construction of a dock to the north of the Edinburgh Dock, and (2) the construction of a dock on the west side of the west pier and north of the marine parade, involving the removal from that quarter of the ship-building yards. A modification of the first scheme has been prepared, and is at present under consideration. It involves the deepening of the fairway, and under it there might be made available more dry dock accommodation, which it seems is urgently required. Half a million sterling is mentioned as the probable cost of the new scheme.

Projected Works near Bolton.—At the Poor-Law Offices, Mawdsley-street, Bolton, on Tuesday, Mr. Arnold Taylor, one of the Inspectors for the Local Government Board, held an inquiry into applications by the Rural Sanitary Authority of the Bolton Union for sanction to borrow a sum of 4,860*l*. for defraying the cost of carrying out large private street improvements in Great Lever (part of the No. 1 Special Drainage District of the Authority), and another sum of 400*l*. for works of sewering in the rural portion of Rumworth. Mr. Atherton, the Surveyor to the Authority, gave evidence as to the details of the schemes.

Shipley and Windhill Sewerage.—At the meeting of the Windhill Local Board, on the 23rd inst., a letter was read from the Local Government Board, in answer to the application made jointly with the Shipley Local Board for the issue of a provisional order constituting Shipley and Windhill a joint board for the dealing with the sewage of the two districts. In their reply the Local Government Board refer to the proposed amalgamation or incorporation of Shipley and Windhill for local government purposes, and state that they defer their decision as to the provisional order pending further information as to the amalgamation question.

Contemplated New Port on the South Coast.—At a meeting of the New Romney Level Commissioners, last week, the subject of the assessment of the railway-station at Littlestone-on-Sea was discussed. This railway is worked by the South-Eastern Company, but it was stated that it still belongs to the company to whom the Act for making the line was originally granted, namely, the Appledore, Lydd, and New Romney Railway Company. The Clerk to the Commissioners stated that the South-Eastern Company have decided not to acquire this branch railway by purchase, inasmuch as it is in contemplation to run a line of steamboats from Littlestone, which is in the east bay of Dungeness. A line of steamers in connection with the Appledore, Lydd, and New Romney Railway Company will be outside the agreement between the South-Eastern and London, Chatham, and Dover Companies. Not only (says the *South-Eastern Gazette*) have plans for the construction of a large landing-pier been prepared for the Littlestone Estate Company, who are virtually the proprietors of the branch railway, but the spot where it is to be commenced is marked out, and the proprietors of the Littlestone estate say the pier will be proceeded with next year.

Lectures for Sanitary Officers.—Under the auspices of the Sanitary Institute, a course of lectures has been arranged for the special instruction of those desirous of obtaining knowledge of the duties of sanitary officers. The various subjects will be dealt with in a course of sixteen lectures, given by well-known authorities, and will be illustrated with diagrams, drawings, and models. These lectures are a continuation of the courses previously held by the Parkes Museum, and it is proposed to repeat the course twice each year, to suit the requirements of persons preparing for the Examinations of the Institute. The lectures will comprise the subjects scheduled for these Examinations. The first lecture was announced to be delivered by Sir Douglas Galton on Friday, Oct. 3, subject, "Ventilation, Warming, and Lighting."

Sewage Disposal.—We are informed that the Local Board of West Derby have asked Messrs. Bailey, Danton, & Co., of Palace-chambers, Westminster, to advise them on the question of sewage disposal.

STAINED GLASS AND DECORATION.

The North Window of Dodington Church has just been filled with stained glass. The subject selected is the wise men presenting their offerings to the infant Saviour. The window is the work of Messrs. Joseph Bell & Sons, of College-green, Bristol.

Memorial Windows in Calton Parish Church.—On the 6th ult. were unveiled in Calton Church four stained-glass windows, the gifts of Sir John Neilson Cuthbertson, in memory of his grandfather and grandmother, who, with their family, were members of Calton Church for many years; of Councillor Dr. Neilson, in memory of his wife and daughter; of Rev. John Murray, minister of the parish, in memory of his father and mother; and of Mr. David Brown, jun., in memory of his mother. The windows were all executed by Mr. Edwards, of Hooper & Edwards, Bothwell-street, Glasgow.

Memorial Window at St. Giles's Cathedral, Edinburgh.—A stained-glass window to the memory of the late Mrs. Cameron Lees has just been placed in the nave of St. Giles's Cathedral. The memorial window is that above the session-house on the west side of the north transept. The window—a three-light one—is divided by a transom into an upper and lower half, the compartments of which are filled with figures symbolical of the Christian virtues. In the upper half the figures are those of "Faith," "Hope," and "Charity"; and in the lower half of "Truth," "Justice," and "Mercy." The window is stated by the *Scotsman* to be by Cottier, of London.

Lewisham.—A stained glass window has just been placed in St. Mark's Church, Lewisham. The window consists of three lights, and illustrates the Sermon on the Mount, with architectural canopy work over. In the tracery are figures of angels with scrolls. The work was executed by Messrs. Warrington & Co.

Brockley.—Messrs. Britten & Gilson have in hand a memorial window for the Lewisham High-road Congregational Church at Brockley, of which they have sent us a lithograph. The design is rather unusual in effect, consisting entirely of conventional foliage design in panels—one long panel with foiled ends in the centre of each light, and a quatrefoil above and below; in the long panel a scroll is intertwined for the inscription. The lower portion of each light is left plain, with diamond panes, except the border which runs round the whole.

South Kelsey Church, Lincolnshire, has just been supplied with two memorial stained-glass windows on either side of the chancel, the gift of Mrs. M. F. Brewster, of Nottingham. The windows were designed and executed by Mr. Jno. Duff, London.

Window, Holy Innocents' Church, Fallowfield.—A new memorial window, which has been placed in Holy Innocents' Church, Fallowfield, to the memory of the late Mr. G. H. Gilliat, was unveiled and dedicated on the 27th ult. The window contains four pictures, illustrative of scenes in the Saviour's life, subsequent to the Resurrection, and completes the series of subjects selected for the windows in the apse of the church. The window has been erected by Messrs. Lavers & Westlake, of London.

New Reredos, St. Michael's Church, Maidstone.—On the 27th ult. a new carved oak reredos and fresco painting was unveiled at St. Michael's Church, Maidstone. The design comprises a central recess for the metal cross, and on either side two of the four Evangelists. Over these figures are canopies with delicate traceries and carved crockets, and along the top runs a carved frieze with embattled work. In addition to the reredos itself, the remainder of the east wall below the window has been pannelled in oak and carving. The reredos was designed by Sir Arthur Blomfield, and executed, as regards the oak carving, by Messrs. Pryer, of West Borough, and as regards the figured panels by Messrs. Heaton, Butler, & Bayne, of London.

FOREIGN AND COLONIAL.

France.—An exhibition has been organised at Valenciennes, in the rooms of the Hôtel de Ville, of the works of artists born, educated, or residing and working in that arrondissement. It includes more than six hundred works, some of them of remarkable merit.——The Société des Amis des Arts of Versailles has opened its thirty-seventh annual exhibition, consisting of over seven hundred works of various classes.——At Royat (Puy de Dôme) a new theatre is being built, in keeping with the general luxury of appointment of this much-frequented southern resort.——The inundations in the south of France have produced numerous disasters. Among these may be mentioned the wrecking of the railway bridge at Beauchastel, on the Lyons and Nimes line, and the overthrow of the viaduct of Pont St. Esprit by the flooding of the Ardèche. The partial destruction of the fine viaduct at Luech is also announced. This viaduct, of twenty-nine arches and 46 mètres in height, was built in 1843, on the road between Paris and Nimes.——At Bastelica, Corsica, the statue of the national hero, Sampiero Corso, has been inaugurated. The statue is the work of M. Vital Dubray.——An inhabitant of St. Hilaire has had the singular idea of constructing, in the cemetery at that place, a representation of the Eiffel Tower as a monument over the tomb of his parents. It is 7 mètres high and surmounted by a cross! On the first platform is a statue of St. Joseph, and on a marble tablet fitted between the four main piers are engraved the names of the persons who have the misfortune to repose under this novel and absurd monument.——At Rambouillet (Seine-et-Oise) the funeral of an eminent French contractor, M. Dallemagne, has just taken place. He was well known as one of the ablest and most devoted coadjutors of many eminent Parisian architects. He worked on a great many of the principal buildings erected from 1850 to 1870, notably at the Palais de Justice, the Halles Centrales, the Châtelet Theatre, the National Library, the new Morgue, &c. He was a man of remarkable ability in his business.——It is announced that the Military Engineering Department propose to pull down the "Porte de France" constructed by Vanban at Belfort, and one of the archæological curiosities of that town. The people of Belfort are strenuously opposing its demolition, rightly valuing it as a most interesting record of the past.——At Saint Servan, near St. Malo, it is stated that the remains of the ancient cathedral of Aleth have been discovered, which was the episcopal seat of Saint Malo, first bishop of that ancient city. The foundations of the building have been discovered, and some of the walls contiguous to the existing chapel of St. Pierre.

Berlin.—We hear that the greater number of the artists invited by the Chancellor (or, rather, by the Emperor) of Germany to compete in the new "National Monument Competition," before mentioned in our columns, intend to send in a protest about the non-mention of the names of the assessing body (it being feared that William II. wishes to decide the matter according to his own and Professor Bega's ideas), and, if it comes to extremes, to send in refusals to the invitation.

Palermo.—The provisional buildings to be erected on the extensive grounds which will be occupied by the Italian National Exhibition in the winter of 1891 have been taken in hand. On a corner position of the grounds (situated near the Porta Macqueda) there will soon rise the main building, which will contain the large central hall, machinery hall, and manufactured goods section. This building will have a main frontage of 258 mètres, with a depth of 80 mètres. The style chosen is the so-called "Norman-Sicilian." The cost has been estimated at 521,000 lire, the construction being of iron and wood. The "Fine-arts Pavilion" will soon be commenced, this erection measuring 130 mètres by 70 mètres, and being in a light Italian Renaissance style. The architect in charge is Professor Ernesto Basile. The opening of the exhibition is to take place on November 1, 1891.

Natural Gas Getting Short in America.—*Industries* says that at the recent meeting of the Indianapolis Association for the Advancement of Science, Professor Orton, the Ohio geologist, in discussing the probability of exhaustion of the supply of natural gas, said that the supply is not only exhaustible, but is rapidly and surely vanishing. He urges the imperative necessity of cities and states taking action to resist wasteful use of gas, but even the strictest regulations, he says, cannot prevent the exhaustion of the supply in a few years. Within a week comes the report of a shortness of gas more general than any previous one. At Jones & Laughlin's American Iron Works, at Pittsburg, the men are not making full time, and at the Republic Iron Works the gas supply is short. People using their own wells are also feeling the shortness. Officials of the gas companies will not admit that the supply is in danger of exhaustion, but it is the opinion of many competent judges that Pittsburg manufacturers will soon have to use manufactured gas, or return to the use of coal.

MISCELLANEOUS.

Ecclesiastical Art Exhibition at Hull.—In connexion with the Church Congress, which is being held this week at Hull, an ecclesiastical art exhibition has been held, including a loan collection of nearly 600 exhibits. Church plate, which has for many years past formed a prominent object at these exhibitions, was represented by the communion vessels from Holy Trinity and St. Mary's, Hull; St. Mary's, Beverley; Preston-in-Holderness; Burton Agnes; St. Michael-le-Belfrey, York; Swine; Guisborough; Howden; Bugthorpe; Pontefract; and Middleton. Several private owners also contributed ancient examples from their collections. Local ecclesiology was represented by a number of drawings, engravings, and books, having reference to the churches and monastic remains of the neighbourhood, which abounds in interesting antiquarian associations. Mr. Franks lent a collection of rubbings of monumental brasses, and Mr. Peck also contributed examples of the same kind.

Royal Victoria Hall, Waterloo Bridge-road, S.E.—The autumn series of lectures at the above Hall commenced with the first of two "People's Lectures" (under the auspices of the London Society for the Extension of University Teaching), by Mr. J. D. McClure, on "Nebulæ," on Tuesday last. Next Tuesday Mr. McClure will lecture on "The Sun." The arrangements for lectures during the rest of the month are as follows:—Oct. 14, "Bees as Florists and Fruit-producers," by the Rev. Prof. Cheshire. Oct. 21, "The Colours of Animals and their uses," by Dr. W. D. Halliburton. Oct. 28, "Mountaineering," by Mr. H. G. Willink.

The Surveyors' Institution has just announced that the next Preliminary Examination for the admission of students will be held on Wednesday and Thursday, January 21 and 22, 1891. It is proposed to examine candidates from the counties of Lancashire, Cheshire, Yorkshire, Durham, Cumberland, Westmoreland, and Northumberland, at Manchester. Candidates from other counties in England and Wales will be examined in London. Notice is also given that the next Annual Professional Examinations for Land Agents, Valuers, and Building Surveyors (held under the provisions of the Charter and qualifying for the Fellowship and Associateship of the Institution) will commence on March 16, 1891. Candidates for the Professional Examinations will be examined in London only. All particulars as to days, subjects, course of examination, prizes, and scholarships can be obtained of the Secretary. Notice is also given that the next Special-Certificate Examinations (for members) in Forestry, Sanitary Science, and Land Surveying and Levelling, will be held on Tuesday, Wednesday, and Thursday, June 16, 17, and 18, 1891.

Architecture at University College, London.—We have received the programme of the classes for the study of Architecture, Construction, and Modern Practice, conducted by Professor T. Roger Smith, F.R.I.B.A., at University College, for session 1890-91. Three courses of lectures are given. Course A, on Architecture as a Fine Art, treated historically, consists of thirty lectures, divided into three terms of ten lectures each, delivered every Tuesday evening from 6 to 7.10; first lecture, Tuesday, October 7. Course B, on Architecture as a Science or Constructive Art, consists of thirty lectures, divided into three terms of ten lectures each, delivered every Wednesday evening from 6 to 7.10; first lecture, Wednesday, October 8. Course C, on Modern Practice, consists of eight or ten lectures in the first or Christmas term, delivered every Monday evening from 6 to 7.15; first lecture, Monday, October 6. Examinations will take place, and at the end of the session the following prizes and certificates will be awarded should the work done by the students at the final examination be of sufficient merit. For the best answers in either A or B, the Donaldson Silver Medal; for the second best, a prize of books. For the best set of sketches, illustrative of the work of either course, a prize of books. For the best answers to questions in Modern Practice, a prize of books. Certificates of first, second, and third-class rank will also be given to those students who may merit them by the general excellence of their answers to questions set in the examination.

Building Trade Wages in Jamaica.—According to a recent report by the United States Consul, at Kingston, Jamaica, on the condition of that island, the working hours in the neighbourhood of Kingston are from 6 a.m. to 5 p.m., with one hour for breakfast between 11 and 12; on Saturdays from 6 to 11 a.m. In the country the hours vary considerably, but, as a rule, they are from 7 a.m. to 4 p.m., with one hour for breakfast, and the people seldom turn out to work on Saturdays. The average rates of wages paid about Kingston under ordinary circumstances are:—

DAY WORK.		s.	d.
Bricklayers	per day	3	1½
Carpenters	,,	3	1½
Joiners	,,	3	1½
Masons	,,	3	1½
Painters	,,	3	1½
Labourers	,,	2	1
Hire of mule and cart (or dray)	,,	5	2½
Hire of two mules and cart (or dray)	,,	7	3½

CONTRACT WORK.		s.	d.
Breaking road-metal	per cubic yard	1	6
Bricks, making and burning, including cost of wood	per 1,000 23s. 7d. to	31	3
Brickwork (ordinary)	per cubic yard	8	4
Drilling and blasting rock	per linear foot	0	4
Excavating and throwing out earth	per cubic yard	0	9
Excavating and throwing out earth and removing to a distance not exceeding 30 yds.	per cubic yard	1	6
Excavating rocks (including blasting material)	per cubic yard	4	2
Painting per coat	per square yard	0	1½
Shingling	per square of 100 feet	3	7½
Walling, dry stone	per cubic yard	1	3½
Walling, rubble in mortar	per cubic yard	7	3½

Day labour rates are lower in the country districts, but, after making allowance for shorter hours, the rates remain practically the same for both country and town. In some parts artisans are very scarce, and are getting scarcer every year, and inferior men have to be employed at town prices. Wages have an upward tendency. The foregoing prices do not refer to work on estates, which is paid for at somewhat lower rates.

The Plumbers' Company.—At the Guildhall, on Monday, the officers of the Worshipful Company of Plumbers for the year ensuing were sworn in as follows:—Mr. W. H. Bishop, Master; Mr. Chas. Hudson, Warden; and Mr. Philip Wilkinson, Renter Warden. Mr. G. C. Sherria, architect, was elected a Liveryman of the Company. The Court subsequently entertained at dinner a number of guests, including the Master of the Worshipful Company of Glaziers, and Mr. H. D. Davis, Architect of the City of London School. Sir Philip Magnus, in responding to the toast "Industrial Education," referred to the large increase in the number of students attending the plumbing classes in connexion with the City and Guilds Institute, stating that 569 students presented themselves at the last examinations held by the Institute. He said the Institute welcomed the graded scheme formulated by the Plumbers' Company for the training of plumbers, commencing at the period of their apprenticeship, and providing for examinations at three stages, preliminary, intermediate, and final,—the last entitling successful candidates to enrolment under the rules of the National Registration of Plumbers.

Hamblett's "Marble-Porcelain" Tiles.—This is the name given to a method of preparing floor-tiling shown in a pattern-book sent to us by Mr. J. Hamblett, of Bromwich, which consists in laying surfaces or panels with small tiles about 2 in. square, each tile worked with a mottled face in two or more colours, so that the total effect is that of a random mosaic, the joints being little noticeable amid the irregular colouring. It is not, as the patentee claims, superior to mosaic, but it gives somewhat of the same effect at a probably lower cost.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Plans for New Cemetery	Melton Mowbray L. B.	20 and 10 guineas..	Jan. 20/91

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Boundary Wall, &c.	Belfast Union	Young & Mackenzie ..	Oct. 7
*Drain Pipes, Coals, Stores, &c.	Croydon Council	*Official*	do.
Reading Room and Assembly Hall, Wetheral, Carlisle		A. W. Johnston	Oct. 8
Iron Footbridge, Rusholme	Manchester Corp.	*Official*	do.
Swedish Timber	Gravesend and Milton Union	do.	do.
*Rebuilding "Plough Inn," Coventry	J. Eadie, Esq.	H. W. Chattaway	do.
*York Paving Stone	Mile End Vestry	J. M. Knight	do.
Vicarage, &c. Featherstone, Yorks.		Arthur A. Stott	Oct. 9
Steel and Iron Girders, &c.	Indian Mid. Ry Co. Lim.	*Official*	do.
School Buildings, Percy Main	Tynemouth Sch. Bd.	F. R. N. Haswell	Oct. 10
Deepening Reservoir	Glasgow Corporation Water Commrs.	Mr. Gale	Oct. 11
Deep Drain (300 yds. in length)	Armley (Leeds) Bur. Bd.	*Official*	do.
Alterations, &c. Teacher's House, at Public School, Portgordon, N.B.		Geo. Sutherland	do.
Infant School, Littleburn, near Newcastle-on-Tyne			do.
*Machinery for Sewage Disposal Works	Teddington Local Bd.	*Official*	Oct. 13
Repairs to Buildings, &c. Walmil	Com. of H.M. Works	do.	Oct. 14
*Paving Works	Lewisham Bd. of Wks.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Baptist Chapel, Hafod, near Pontypridd	Rev. T. Davies		Oct. 14
*Broken Guernsey Granite	Willesden Local Board	O. Claude Robson	do.
*Fire Brigade Station, Wandsworth	London County Council	*Official*	do.
*Barging-away Dust, Ashes, &c.	Greenwich Bd. of Wks.	do.	Oct. 15
*Broken Flints		do.	do.
Re-building Ward Bridge, Walkampton	Devon County Council	E. H. Harbottle	do.
Re-building Harford Bridge, Peter Tavy	do.	do.	do.
*New Police Court, Wandsworth	Com. of H. M. Works	*Official*	do.
*Removal of Slop	Hampstead Vestry	do.	Oct. 16
*Paths, Alterations, &c. S.E. Hospital	Met. Asylums Board	H. Jarvis & Son	do.
New Boiler House	Cardiff Union	Seward & Thomas	Oct. 17
*Additions to London University Buildings	Com. of H. M. Works	*Official*	Oct. 20
*New Postal Sorting Office, Sheffield	do.	do.	do.
*Coast Guard Station, Walton-on-Naze	Admiralty	do.	Oct. 29
Sinking Two Deep Pits, near Neath	Main Colliery Co. Lim.	do.	No date
New Rooms for Cookery	Gateshead School Bd.	do.	do.
School, Woodbourn	Sheffield School Board	Wightman & Wightman	do.
New Warehouse, Newcastle-on-Tyne	E. & F. Turnbull	Edwd. Shewbrooks	do.
*Construction and Enlargement of Board Schools	School Bd. for London	*Official*	do.
*Thirteen Cottages at Colchester	Salvation Army	W. Gilbee Scott	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Surveyor's Clerk	Wimbledon Local Bd	100*l.*	Oct. 8
*Assistant Borough Surveyor	Southampton Corp.	120*l.*	Oct. 13

Those marked with an Asterisk (*) are advertised in this Number. Competition, p. iv. Contracts, pp iv., vi., and viii. Public Appointments, p. xvi.

LORD HILL'S ESTATES.—The Stanton Estate of Lord Hill of Hawkstone, comprising 1,217 acres, was offered for sale at Shrewsbury, on the 24th ult., in 27 lots. Stanton Farm, 181 acres, with a rental of 319*l.*, was withdrawn at 5,000*l.*; and another farm of 135 acres, rent, 231*l.* 16s., met with no bidder. A water corn-mill, having a rental of 66*l.* 10s., was withdrawn at 1,075*l.* The freehold estate, the Hazels, comprising 463 acres, was withdrawn at 9,500*l.*, after keen bidding, which rose from 4,000*l.* The Coolmoor Estate of 83 acres was bought by Mr. Corser, of Shrewsbury, for 3,000*l.* A freehold and fully-licensed house the New Inn, was bought by Mr. W. Hall, brewer, of Wenn, for 1,200*l.* Hilcop Bank Estate, a freehold farm, was withdrawn at 5,400*l.* 0s. 11d.

THE ENGLISH IRON TRADE.—There is no doubt that the crude iron market is still seriously disturbed by the dispute between the Scotch iron masters and their men, but the general market is steady, and there is a considerable business in finished iron and steel. The Glasgow warrant market has been greatly excited, but its tendency, on the whole, has been upwards. Scotch makers' iron is higher in price, but irregular. Middlesbrough pig has been somewhat similarly affected, but there is no increase in price compared with last week. The other pig-iron markets are also unsettled, hematite pig being the least disturbed. The demand for finished iron is well maintained, and prices are strong. The enquiry for steel rails and shipbuilding material being better, there has been a further stiffening up of values. Manufacturers both of iron and steel, however, are rather backward in taking orders. Shipbuilders have secured more orders. Engineers continue well employed.—*Iron.*

SOME PLUMBING NOTES.—The County Council for the West Riding of Yorkshire have passed a resolution to the effect that "No plumbers be engaged on work in connexion with county buildings, except persons duly registered, as suggested by the Worshipful Company of Plumbers."——At the opening of the winter session of the Manchester Technical School, Mr. John Smeaton, of the Worshipful Company of Plumbers, gave an address in the Lecture-hall on "Plumbing and Sanitary Science." Mr. Smeaton said the Plumbers' Company felt that all plumbers ought to pass a proper period in the workshop, and should pass a certain time in schools such as that at Manchester. The teaching of plumbing should include the arithmetic of the workshop and some knowledge of geometry and drawing. A knowledge of mechanics, of hydrostatics in relation to syphons and water-gauges, of the results of heat and the expansion and contraction of metals, of chemistry, the action of the various waters and gases upon his materials, and of machine drawing, was necessary for the plumber, and he should have some slight knowledge of electricity, as well as be thoroughly acquainted with the practical details of work.——On the 24th ult., in the Dundee Technical Institute, Mr. J. Radcliffe, R.P., member of the Sanitary Institute of Great Britain, and principal teacher of plumbers' work and sanitary engineering at the Manchester Technical School, delivered the opening lecture in the plumbers' classes connected with the Institute. Mr. Radcliffe maintained that a scientific education was necessary for a plumber. He ought to be acquainted with the sciences, especially chemistry, and he ought also to be thoroughly up in mechanics, mathematics, and geometry. Heat was another important science for the plumber. They all knew that water expanded or contracted according to the application of heat or cold respectively, and it was well that the plumber should be acquainted with what would take place in lead work from heat or cold.

CLOCK, TOWN HALL, LOCKERBIE.—The new clock at the Town Hall, Lockerbie, is the gift of Mr. Andrew J. S. Johnstone, of Halleaths, and is by Mr. J. W. Benson, of London. The clock shows the time upon four illuminated dials, 5 ft. in diameter.

OXFORD MUSIC-HALL.—An order has been made in Mr. Justice Sterling's Court, Chancery Division, for the sale, under provisions of the late Mr. Morris Robert Syers's will, of the Oxford Music-hall. The property consists of one lot, comprising the music-hall, with the adjoining Nos. 18 and 20, Oxford-street, and the fully licensed premises known as the "Boar and Castle." The vendors hold these upon a fifty years' lease, of which twenty years, reckoning from last Lady-day, are still unexpired, at ground-rents amounting to 925*l.* per annum. The hall, with its gallery and boxes, has a total capacity for nearly 1,200 persons. It is said to be one of the first, *sui generis*, to have been established in London. If we remember aright, the premises have been twice destroyed by fire. The "Boar and Castle" tavern represents a posting-house and inn which flourished during the seventeenth century.

LONDON MECHANICAL STUDIO. — At No. 45, Wilson-street, Finsbury-square, E.C., an amateur class-room has been started, where are taught (practically) carpentry, cabinet-making, wood-carving, wood and metal turning, &c. The room is filled with benches, lathes, and all the necessary tools required. Mr. T. J. Syer is the principal.

SILCHESTER.—A correspondent of the *Times* writes:—"A discovery of the greatest interest has just rewarded Mr. St. John Hope and his fellow explorers at Silchester. In one of the houses, the foundations of which have been laid bare, the excavators came across a dry well, which, on being explored, proved quite a little museum of antiquities. Some 15 ft. down the diggers found an urn-shaped pottery vase, about 1 ft. high, quite intact, and, curiously enough, protected by lumps of chalk built around it. The vase, which probably originally contained some precious substance, was, however, quite empty. Above it were deposited a great number of iron implements, most of which were in a wonderful state of preservation. They seem to have been the tools of a carpenter and a coppersmith or silversmith, with some miscellaneous objects of blacksmith's work thrown in. The principal specimen is a carpenter's plane of quite modern type, although unquestionably more than 1,500 years old, three or four axes, retaining their fine cutting edges and still quite serviceable, a number of chisels and gouges of all shapes and sizes, hammers, adzes, saws, files, &c. In the smith's department may be specified a brazier for burning charcoal, quite complete, two or three anvils of different sizes and shapes, a fine pair of tongs adapted for lifting crucibles, a curious tripod candelabrum lamp, or candlestick, and several other curious objects the precise uses of which have not yet been determined."

MEETINGS.

SATURDAY, OCTOBER 4.

Association of Public Sanitary Inspectors.—Annual General Meeting to receive the annual report, &c. 6 p.m.

MONDAY, OCTOBER 6.

Society of Engineers.—Mr. W. Santo Crimp on "Sewer Ventilation." 7.30 p.m.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. W. Baker. 8 p.m.

Liverpool Architectural Society.—Opening address by the President, Mr. T. Mellard Reade. 7 p.m.

TUESDAY, OCTOBER 7.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. Law on "Principles of Calculating Areas, Cubic Space, &c.; Interpretations of Plans and Sections to Scale." 8 p.m.

Glasgow Architectural Association.—Mr. H. Mitchell on "Greek Architecture." 8 p.m.

FRIDAY, OCTOBER 10.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Louis Parkes on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

12,737.—WINDOW WEDGES: *R. Batey.*—The window wedge clasps which are the subject of this invention are made with a wedge-shaped hook; one of these clasps are fixed on each side the window-sash, so that on their coming together in shutting at the meeting rails they bite, by the clasps locking each other.

13,847.—ORNAMENTING AND DECORATING CEILINGS AND WALLS: *J. A. Wilson and Another.*—For ceilings or walls of buildings, shop fronts, verandahs, &c., glass, coloured or otherwise ornamented, is used in sections and afterwards silvered, painted, or lettered, if desired.

16,178.—WATER-CLOSETS: *H. Hardy.*—This invention relates to a self-acting closet, the water being set free directly the person rises from the seat. The run is not connected inside within an eighth of an inch. This is to allow the water to flush basin, and in the middle of the front part of the basin is a flush-hole, which allows the water to enter halfway down the basin and carry the soil away with force.

8,977.—PAVEMENT LIGHTS, GLAZED GRATINGS, &c.: *J. Jacobs.*—By this invention lenses are formed from the glass by their peculiar shape; they are used either with or without encaustic tiles.

10,809.—VENTILATORS: *J. Jones.*—This invention relates to that class of ventilators, chimney cowls, &c., which revolve by the wind, and have wings, fans, &c., inside, to increase the draught up the shaft or chimney. A collecting space is arranged, and the wings are caused to revolve close to the circumference of the tube or shaft.

15,414.—VENTILATORS: *T. Whitehead.*—It is claimed with regard to these ventilators that the exit aerial space being greater than usual, and the guards being specially arranged so as to offer no friction, the vitiated air is permitted to escape from the place ventilated with greater facility.

NEW APPLICATIONS FOR PATENTS.

September 15.—14,513, T. Cobley and W. Elmore, Manufacture of White Lead. — 14,532, E. Hill, Supporting Window Sashes.

September 16. — 14,597, T. Carn, Window Sashes. — 14,622, W. & C. Martin, Convertible Window Sashes.

September 17.—14,657, L. McQueen, Glazing Windows, Skylights, &c.—14,669, J. Wedderburn, Locks and Bolts for Doors, Gates, &c.—14,702, J. Pope, Ventilators.

September 18.—14,739, S. Haigh, Disinfecting Closets, Drains, &c.—14,763, J. Hird & J. Ford, Casement and Sash Windows, &c.—14,766, R. Haddan, Windows with Horizontal Sliding-sashes, and Lock or Fastener for same.—14,775, A. Glover, Paving Composition.

September 19.—14,790, S. Hill, Adjusting the position of Swing Mirrors, Windows, Ventilators, &c.—14,822, J. Sears, Ventilators.—14,830, F. Walton, Accommodating Electric Wires in Buildings.

September 20.—14,850, W. Edwards & W. Hibbert, Spring Hinges.—14,853, A Pomfret, Current Regulator for Ventilation.—14,877, L. & S. Swale, Syphon Cisterns for Water-closets.—14,902, C. Hueber, Substitute for Decorative Tiles for Furniture, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,462, A. von Solemacher-Antweiler, Bricks, Tiles, &c.—7,312, E. Baudry-Diot, Bridges.—10,610, R. Slatter, Preventing the Steaming of Shop Windows.—10,978, J. Baker, Locks and Latches.—11,563, J. Birchenough, Movable Ornamental Iron Railings.—11,927, W. Morton, Door-knob Attachments.—12,107, W. Worssam, Screwdriver.—12,478, S. Bromhead, Flexible Covering or Lining for Roofs, &c.—12,599, J. Brown, Window-sash Fastener.—12,765, E. Gregory, Blocks for Flooring.—12,922, G. Helmore, Window-sash Fasteners.—12,590, W. Sturmey, Door Locks and Latches.—13,643, T. Harries, Finger Plate for Doors.—13,649, J. Barraclough, Closets, &c.—13,690, F. Berry, Electric Bells or Gongs.—13,745, G. Willcock, Fastening for Window-sashes.—13,764, H. Sutcliffe, Lavatory Wash-basins.—13,896, J. Bramley, Ventilation.—13,957, J. Legge, Door-latches.—14,153, J. Macdonald, Ventilating Sash Bars or Astragals.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

15,593, A. Brookes, Veneers.—15,787, W. Timewell, Portland Cement made from Hard Limestone.—16,183, H. Smith, Fastener for Window-sashes, &c.—16,726, T. Ashenhurst, Knobs or Handles for Doors, and Attaching same to Spindles. — 17,589, J. Hearth, Window-sash Fastener.—18,126, H. King, Flush and Knob Bolts for Doors.—18,474, G. Arnold, Sanitary Flushing Apparatus.—3,197, J. Boult, Circular Saws.—10,974, H. Pickford, Decoration of Walls and Other Surfaces.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

SEPTEMBER 22.—By *Sedgwick, Son, & Weall:* The residences "Grove Hill" and "Two Beeches," 281a. 3r. 20p., f., Hemel Hempstead, Herts, 14,000*l.*; eight freehold cottages, 670*l.*; "Lovett's End Farm," 198a. 3r. 11p., f. and c., r. 200*l.*, 5,000*l.*; "Yew Tree Farm," 45a. 3r. 34p., f., 2,250*l.*; enclosures of f. land, 129a. 3r. 17p., 2,400*l.*; enclosures of f. land, 36a. 0r. 25p., 1,635*l.*; 1,250*l.*; f. accommodation land, 36a. 0r. 25p., 1,635*l.*; f. building land, 28a. 3r. 38p., 3,480*l.*; an enclosure of f. land, 1a. 1r. 35p., 95*l.*; "The White Lion" beer house, f., 830*l.*—By *J. W. Kemsley:* "Watlington House," and 2½ acres, f., Theydon Bois, Essex, 1,600*l.*

SEPTEMBER 23.—By *Osborne & Mercer:* An enclosure of f. land, 1a. 3r. 17p., Hook, near Surbiton, 355*l.*; f. cottage and 5a. 3r. 2p., r. 15*l.* p.a., Eling, Hants, 415*l.*—By *Alder & Co.:* "Wenham House," High-street, Streatham, u.t. 75 yrs., g.r. 38*l.*, r. 150*l.*, 1,600*l.*

SEPTEMBER 24.—By *J. T. Ayton:* 456 and 478, Cable-st., Shadwell, u.t. 10 yrs., g.r. 8*l.*, r. 56*l.*, 320*l.*; three plots of f. land, East Ham, 101*l.*

SEPTEMBER 25.—By *Heaps, Son, & Reeve:* 71, De Beauvoir-rd., Kingsland, u.t. 27 yrs., g.r. 4*l.* 10s., r. 36*l.*, 250*l.*—By *E. Stimson:* 7, Delaford-st., Fulham, u.t. 88 yrs., g.r. 5*l.* 5s., r. 32*l.* 10s., 150*l.*; 123 to 126 (even), Rockingham-st., Newington Causeway, u.t. 32 yrs., g.r. 12*l.* 12s., r. 135*l.*, 1,200*l.*; 43 to 57 (odd), Barlow-st., Walworth, u.t. 20 yrs., g.r. 20*l.*, r. 228*l.* 16s., 1,006*l.*; 9 to 14, Edward-st., Bermondsey, f., r. 115*l.* 14s., 1,100*l.*; 86, Picton-st., and 2 and 4, Cork-st., Camberwell, u.t. 10 yrs., g.r. 16*l.* 16s., r. 74*l.*, 125*l.*; 36, Hanover-st., Peckham, u.t. 58 yrs., g.r. 10*l.*, 215*l.*; 62 to 70 (even), Darrell-rd., Dulwich, u.t. 88 yrs., g.r. 21*l.*, r. 104*l.*, 520*l.*—By *Newbon & Harding:* f.g.r. of 18*l.* p.a., with reversion in 4 yrs., Barnsbury, 1,080*l.*; f.g.r. of 8*l.*, with reversion in 1 yr., Vittoria-st., 410*l.*; f.g.r. of 24*l.*, with reversion in 11½ yrs., Maygood-st., 905*l.*; f.g.r. of 16*l.*, with reversion in 11½ yrs., Vittoria-st., 460*l.*; f.g.r. of 23*l.* 10s., with reversion in 1½ yrs., 1,355*l.*; f.g.r. of 49*l.* 10s., with reversion in 2½ yrs., 2,100*l.*; f.g.r. of 0*l.*, with reversion in 10½ yrs., Rodney-pl., 255*l.*; f.g.r. of 9*l.*, with reversion in 8½ yrs., 275*l.*; f.g.r. of 7*l.* 10s., with reversion in 20 yrs., 205*l.*; "The Waterman's Arms" beer-house, f., r. 40*l.*, 580*l.*; Nos. 46 to 60 (even), Muriel-st., f., r. 241*l.* 10s., 1,960*l.*—By *W. J. Newell:* 121 to 127 (odd), Alderminster-rd., Bermondsey, u.t. 48 yrs., g.r. 14*l.*, r. 124*l.* 16s., 1,055*l.*; 5 and 6, Lynton-mews, u.t. 44 yrs., g.r. 7*l.*, 310*l.*; 88, 90, and 92, Gibbon-rd., Nunhead, u.t. 88 yrs., g.r. 20*l.*, 485*l.*—By *C. C. & T. Moore:* Nos. 90 and 92, Highgate-rd., f., r. 80*l.*, 1,020*l.*; No. 29, Stamford-hill, u.t. 41 yrs., g.r. 10*l.*, r. 55*l.*, 400*l.*; 17 to 23 (odd), Brownswood-rd., Finsbury-pk., u.t. 86 yrs., g.r. 28*l.*, 1,145*l.*; 13 to 19 (odd), Chilcot-st., Poplar, u.t. 62 yrs., g.r. 10*l.*, r. 83*l.* 4s., 505*l.*; 11, 12, and 13, Mercer-st., Shadwell, u.t. 23 yrs., g.r. 9*l.*, 425*l.*; 42, King David-lane, u.t. 21 yrs., g.r. 2*l.* 10s., r. 33*l.* 16s., 165*l.*; 148 and 150, Rhodeswell-rd., Limehouse, u.t. 23 yrs., g.r. 4*l.* 10s., r. 44*l.*, 250*l.*; 1 to 7 (odd), Thirza-st., Commercial-rd., u.t. 25 yrs., g.r. 13*l.* 7s., 645*l.*; 43, 45, and 47, Hardinge-st., u.t. 25 yrs., g.r. 6*l.*, r. 72*l.*, 455*l.*; 1, Woolsey-st., Mile End, u.t. 11 yrs., no g.r., r. 24*l.*, 90*l.*; 14 to 30, Great James-st., Hoxton, u.t. 3 yrs., g.r. 49*l.* 4s., 220*l.*

SEPTEMBER 26.—By *Green & Son:* 16, Finsbury-st., Chiswell-st., u.t. 38 yrs., g.r. 90*l.*, r. 300*l.*, 1,650*l.*—By *C. & H. White:* 60 and 62, Harrington-rd., Norwood, f., r. 42*l.* 8s., 455*l.*; 102, Shenley-rd., Peckham, u.t. 86 yrs., g.r. 6*l.*, r. 36*l.*, 320*l.*—By *Oetzmann & Co:* 36, Delancey-st., Regent's-pk., f., 1,090.—By *A. V. Robinson:* 1, Green-pk.-ter., Tottenham, f., r. 38*l.*, 320*l.*; 2 and 3, Green-pk.-ter., f., r. 52*l.*, 412*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ..... ton	6 10 0	7 5 0
Teak, E.I. ..... load	10 0 0	13 0 0
Sequoia, U.S. ..... foot cube	0 2 3	0 2 9
Ash, Canada ..... load	2 10 0	4 5 0
Birch "	2 5 0	4 5 0
Elm "	3 10 0	4 15 0
Fir, Dantsic, &c.	2 0 0	3 15 0
Oak "	2 10 0	4 10 0
Canada	5 0 0	6 10 0
Pine, Canada red	2 10 0	3 10 0
" yellow	2 0 0	5 10 0
Lath, Dantsic ..... fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 0 0
Deals, Finland, 2nd & 1st. std. 100	7 15 0	10 0 0
" " 4th and 3rd	7 0 0	7 10 0
Riga	6 0 0	8 10 0
St. Petersburg, 1st yellow	9 10 0	14 10 0
" 2nd "	7 10 0	9 0 0
" white	7 0 0	10 0 0
Swedish	7 0 0	15 0 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	12 0 0	24 0 0
" " 2nd	9 0 0	16 0 0
" " 3rd, &c.	7 0 0	10 0 0
" Spruce, 1st	8 10 0	10 10 0
" " 3rd and 2nd ..	6 10 0	8 0 0
New Brunswick, &c.	5 10 0	7 10 0
Battens, all kinds	4 10 0	15 10 0
Flooring Boards, sq., 1 in., prepared, First	0 10 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 6 0	0 7 9

TIMBER *(continued)*.	£. s. d.	£. s. d.
Cedar, Cuba ..... foot	0 0 3½	0 0 4
Honduras, &c.	0 0 3½	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average ..	0 0 4½	0 0 6½
Mexican "	0 0 4½	0 0 5½
Tobasco "	0 0 5½	0 0 6½
Honduras "	0 0 5½	0 0 6½
Box, Turkey ..... ton	4 0 0	12 0 0
Rose, Rio	13 0 0	19 0 0
Bahia	12 0 0	18 0 0
Satin, St. Domingo ..... foot	0 0 9	0 1 3
Porto Rico	0 0 10	0 1 6
Walnut, Italian	0 0 4	0 0 7

METALS.		
IRON—Bar, Welsh, in London tn	6 10 0	6 17 6
" " at works in Wales	6 0 0	6 10 0
" Staffordshire, in London..	7 0 0	8 0 0
COPPER—British, cake and ingot	66 0 0	0 0 0
Best selected	67 0 0	68 0 0
Sheets, strong	72 10 0	74 0 0
Chili, bars	59 10 0	0 0 0
YELLOW METAL ..... lb.	0 0 6¾	0 0 6¾
LEAD—Pig, Spanish ..... ton	14 5 0	0 0 0
English, com. brands	14 7 6	0 0 0
Sheet, English, 8 lbs. per square foot and upwards....	15 0 0	0 0 0
Pipe	15 10 0	0 0 0
ZINC—English sheet ..... ton	27 5 0	27 10 0
TIN—Straits	102 10 0	0 0 0
Australian	102 10 0	0 0 0
English Ingots	104 0 0	0 0 0

OILS.		
Linseed ..... ton	24 10 0	24 15 0
Cocoanut, Cochin	34 10 0	38 0 0
" Ceylon	34 0 0	0 0 0
Palm, Lagos	31 10 0	32 10 0
Rapeseed, English pale	29 15 0	30 0 0
" brown	28 0 0	0 0 0
Cottonseed, refined	20 10 0	0 0 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	5 10 0	6 0 0
" refined	7 0 0	12 0 0
TAR—Stockholm ..... barrel	1 1 6	0 0 6
Archangel	0 15 0	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BEDFORD.—For further road-making and sewering, &c., on the Queen's Park Estate, Bedford, for Mr. D. C. Preston. Mr. Richard Lund, surveyor, 8, St. Paul's-square, Bedford :—

T. Laughton	£383	G. Harrison, Bedford (accepted)	£360
Jesse Jackson	380		

BRANDON (Suffolk).—Accepted for drainage works at Brandon Park, Suffolk, for the Baron de Barreto. Mr. Edward S. Mansergh, surveyor, 28, Mount-street, Grosvenor-square, W. :—
The Sanitation Co., Ltd., 14, Victoria-st., S.W. £485

BRISTOL.—For the erection of two semi-detached villas, Woodstock-avenue, Alexandra Park Estate, for the Bristol Capitalists' Association, Limited. Mr. A. Barratt, surveyor, Somerset-chambers, Corn-street, Bristol :—

David Morris	£1,100 5 0	Walter Podger	£1,045 0 0
Elijah Love	1,095 10 0	A. Tambling*	940 0 0

* Accepted.

BRISTOL.—For the erection of a pair of semi-detached villas, Rokeby-avenue, Alexandra Park, for the Bristol Capitalists' Association, Limited. Mr. A. Barratt, surveyor, Somerset-chambers, Corn-street, Bristol :—

David Morris	£1,200 0 0	Elijah Love	£998 10 0
Walter Podger	1,030 0 0	A. Tambling (accepted)	960 0 0

BROMLEY.—For the erection of a villa-residence at South Hill Park, Bromley, Kent, for Mr. J. Bramsden. Messrs. Baxter, Payne, & Lepper, surveyors, Bromley and London :—
Hy. Sanford, Bromley (accepted) £1,444 17 5
[No competition.]

CHARLOTTEVILLE (Guildford). — For the erection of school buildings for 400 boys, at Charlotteville, Guildford, for the Guildford School Board. Mr. Wm. G. Lower, architect, 12a, High-street, Guildford :—

Stanley Ellis	£5,360	J. F. Collinson	£4,990
J. Finch	5,000	J. Longley & Co.	4,500
Lansdowne & Co.	4,892	P. Peters	4,250
R. Cook	4,785	T. H. Kingerlee	3,940
R. Smith	4,781	Morgan, Isted, & Morgan	3,736
R. Fink	4,662		

CRICCIETH (Carnarvon).—For extension of main sewers at Criccieth. Messrs. Thomas Roberts & Son, engineers, Portmadoc :—

Owen Morris	£725 0	Humphrey Thomas, Criccieth (accepted)	£594 10
William Thomas	598 0		

Engineer's estimate, £406 10 0.

CROSS ROADS (near Abercarn).—For the erection of an infant school, at Cross Roads, near Abercarn, for the Mynyddislwyn School Board. Mr. A. D. Edwards, architect, Public Hall, Abercarn, Mon. :—

Jno. D. Williams	£1,820	Morris & Thomas	£1,230
Chas. Morgan	1,610	Thos. Williams	1,187
Jno. Linton	1,380	W. A. Linton, Newport*	1,148
Jno. Monks	1,286		

* Accepted.

DEVONPORT.—For the construction of a pipe sewer in Baker's-place, Devonport, for the Devonport Council and East Stonehouse Local Board. Mr. John F. Burns, Devonport, and Mr. J. L. Hodge, East Stonehouse, surveyors :—

S. Collings	£500 0 0	C. L. Duke	£412 0 0
J. Healy	465 12 6	J. Parsons & Son, Plymouth*	406 0 0
T. Shaddock	433 0 0		
Shaddock Bros.	423 0 0		

* Accepted.

EDINBURGH.—For the formation of roads and drainage system of new road at Edinburgh, for the Chisholme Trust. Mr. Jas. B. Dunn, architect, 94, George-street, Edinburgh :—

E. C. Brebner	£1,855 10 6	John Menzies & Son	£1,698 0 0
John Young & Son	1,829 0 0	J. W. & G. Stratton, Edinburgh*	1,646 0 0
Andrew Waddell	1,671 0 0		
John Morris & Son	1,668 0 0		

* Accepted.

ETON (Bucks).—For the erection of bank premises at 54, High-street, Eton, for Messrs. Woodbridge, Lacy, Hartland, Hibbert, & Co. Mr. W. G. Nottage, architect, Windsor :—
C. F. Kearley, Uxbridge (accepted) £1,600 0 0

HALESWORTH (Suffolk).—For the erection of a court-house and superintendent's residence, at Halesworth, Suffolk, for the East Suffolk County Council. Mr. R. Miller, jun., M.Inst.C.E., County Surveyor, Ipswich :—

Gragston	£1,360	Cox	£1,194
Dobson	1,346	Cole	1,166
Everett	1,320	Carter	1,161
Gibbs	1,295	Limmer	1,124
Gibbs	1,212	Howard, Halesworth*	1,099

* Accepted.

HINCKLEY.—For the construction of three new streets, Hill-street and the Lawns, Hinckley, for the Hinckley and South Leicestershire Permanent Benefit Building Society. Mr. Thos. Harrold, surveyor, Castle-street, Hinckley :—

G. Wright & Co.	£1,499 0 0	J. D. Gibbins	£927 2 5
J. Mason	892 9 11	J. Jackson	668 0 0
T. E. Bower	868 12 7	Deffern & Grantham, Hinckley*	732 0 11½
T. Philbrick	830 13 3		
A. Moreton	795 0 0	H. Hewitt	749 8 9

* Accepted, schedule prices for footway being lowest.

HORLEY (Surrey).—For the erection of a new Constitutional Club and Public Hall, Station-road, Horley, Surrey, for Mr. John Maple. Mr. Edward Blundell, architect, 27, Church-road, Richmond, Surrey :—
J. Brown, Horley (accepted) £1,600 0 0

KEYNSHAM.—For alterations in the Vagrant Wards at the Workhouse, Keynsham, for the Keynsham Union Guardians. Mr. John Mackay, architect, Kingswood, near Bristol :—

George Humphries	£373 0	Henry West, Monmouth-place, Bath*	£300 0
C. Wibley	328 8		
John Carter	304 12	Chas. P. King & Son	260 0
William Dable	248 7		

* Accepted.

LLANFAREDD.—For the restoration of a church at Llanfaredd, Radnorshire, for the Rev. A. G. Adamson. Mr. Ernest Collier, architect, Carmarthen :—

Price & Deakin	£290 0 0		
John Williams, Knighton, Radnor (accepted)	240 17 0		

[Architect's estimate, £300.]

LONDON.—For the erection of new stabling and other buildings at Latimer-road, Hammersmith, for the London General Omnibus Company. Mr. Percy W. Britton, Superintendent of Works. Quantities by Mr. A. J. Bolton, 55, Lincoln's-inn-fields, W.C. :—

Scharian & Co.	£5,697	Cowley & Drake	£4,955
Martin	5,395	H. D. Evans	4,895
Haynes	5,320	Tunn	4,869
Knight	5,040	Parker	4,800
R. & E. Evans	5,039	Munt (accepted)	4,795

LONDON.—For the erection of four shops in Old Kent-road, S.E., for Mr. W. J. Huxley. Mr. Edwin E. Niblett, architect, Hackney. Quantities by Mr. Stafford Elsmore, 11, Union Chambers, Old Broad-street, E.C. :—

Spencer	£2,172	Burman & Son	£2,040
Gould & Brand	2,140	Smith	1,979
Anley	2,125	G. E. Todd (accepted)	1,939

LONDON.—For the construction of new brick and pipe sewers, &c., in St. Marylebone, for the Vestry. Mr. H. Tomkins, Surveyor, Court House, Marylebone-lane, W.C. :—

	A	B	C
J. H. Neave	£4,315 0 0	£4,230 0 0	£4,194 0 0
J. Marshall	5,600 0 0	6,100 0 0	5,600 0 0
Rogers & Co.	3,910 0 0	4,170 0 0	4,025 0 0
Neave & Son	4,290 0 0	3,960 0 0	4,726 0 0
G. Nash	4,756 0 0	4,559 0 0	4,595 0 0
S. & W. Pattinson	5,600 0 0	5,592 0 0	5,960 0 0
Cooke & Co.	4,471 0 0	4,476 0 0	4,908 0 0
George Bell	4,425 0 0	4,555 0 0	5,062 0 0
W. J. Botterill & Co.	5,697 0 0	5,891 0 0	7,089 0 0
Joseph Mears, Collingham-gardens, S.W.	3,650 0 0*	3,823 0 0	4,230 0 0
Killingback & Co.	4,450 0 0	4,375 0 0	4,690 0 0
Leonard Bottoms	4,022 0 0	3,900 0 0	4,500 0 0
Richard Ballard, Child's-hill	3,847 0 0	3,687 0 0†	4,397 0 0
A. Kellett	4,606 3 6	4,600 8 7	4,772 19 7
Thomas Adams	3,927 0 0	3,999 0 0	4,444 0 0
R. Mayo & Co., Brixton	3,690 0 0	3,896 0 0	3,894 9 0‡

* Accepted. † Accepted. ‡ Accepted.

LONDON.—For bar-fittings at the "Plough Tavern," Mile End-road, E. Mr. W. D. Church, architect, 12, South-place, Finsbury, E.C. Quantities by Messrs. C. Stanger & Son, surveyors, 21, Finsbury-pavement, E.C. :—

Trent Brothers	£1,677	W. Shurmur	£1,393
Cocks Brothers	1,624	W. H. Lascelles & Co.	1,340
S. Godden	1,447		

LONDON.—For the construction of a 15 in. sewer, and forming and kerbing road in Gowan-avenue, Fulham, for the Trustees of the Durell-Blake Estate. Mr. Thomas Spink, engineer and surveyor, 26, Charing-cross, S.W. :—

Mowlem & Co.	£1,026	Nowell & Robson*	£973
Richard Ballard	1,034		

* Accepted.

LONDON.—For the construction of sewers, and making and kerbing roads on the Fortune Gate Estate, Willesden, for the Globe Land and House Property Trust, Limited. Mr. Thomas Spink, engineer and surveyor, 2½, Charing-cross, S.W. :—

Mowlem & Co.	£1,961	Richard Ballard*	£1,547
Nowell & Robson	1,619		

* Accepted.

LONDON.—For erecting the first portion of two factories on land fronting Baldwin's-gardens, Gray's-inn-road, W.C., for Mr. Frederick Sage. Mr. Walter Graves, A.R.I.B.A., architect :—

Pitman & Son	£1,336	Mortar	£1,201
Parker	1,240	Nightingale	1,198
Harris & Wardrop	1,237	Lawrence & Sons	1,160
Williams	1,230		

LONDON.—For sanitary works, general repairs, and decorations, at No. 44, Queen's Gate-terrace, for Colonel J. F. Free, R.H.A. Mr. R. Sammons, surveyor, 30, Bedford-row, W.C. :—

Godfrey Giles & Co.	£1,475 10 0	Duffield & Son	£1,195 0 0
Whiteley	1,307 0 0	R. C. Frost (accepted)	1,169 0 0

LONDON.—For erecting three cottages, Canning-place, Grove-lane, Camberwell, for Mr. Walter Coles. Mr. S. C. McMurdie, architect, 23, Wildash-road, East Dulwich :—

F. F. Treweeke	£595 0	A. & W. Garnar	£495 0
H. H. Hollingawke	553 0	J. Watson	466 0
King & Sons	521 12	A. Coldman	394 10

LONDON.—For alterations, &c., to the "Bank of England" public-house, South Wharf-road, Paddington, for Mr. C. P. Sutton. Mr. C. W. Brooks, architect, 63, Finsbury-pavement, E.C. :—

Edgar	£455	Vears & Co.	389
Young & Lonsdale	398	Bristow	354
Todd	390		

LONDON.—For rebuilding No. 10, Marshalsea-road, Southwark, for Mr. F. Thomas. Mr. S. C. McMurdie, architect, 23, Wildash-road, East Dulwich :—
Kennett & Yells (accepted) £490 10 0

LONDON.—For alterations at the "Albion" tavern, Albion-road E., for Mr. A. Sanderson. Mr. W. G. Shoebridge, architect, 198, Strand, W.C. :—

Walker Bros.	£324	Turtle & Appleton	£293
Hucket	295	Taylor & Son (accepted)	279

LONDON.—For alterations to 128 and 129, Jermyn-street. Mr. W. Graves, A.R.I.B.A., architect :—
Pitman & Son ..... £470 0 0 | Bowyer £458 10 0

LUDDENDEN FOOT.—For dressing, setting, and laying kerbstones, also for excavating and laying a pipe-sewer in Luddenden-lane, Luddenden Foot, Manchester, for the Luddenden Foot Local Board. Mr. Henry Barber, Surveyor, Luddenden Foot, Manchester :—

Thos. Kitchen, Halifax :—4d. per lineal yard for pulling up old curb and laying of new; 9d., for pulling up old setts and paving new; 1s. 2d. for dressing old setts and paving; 1s., for making drain 3 ft. deep (labour only).

Wm. Booth, Luddenden Foot :—8d., for pulling up old setts and paving new; 11½d., for pulling up old setts, and dressing and paving; 1s. 6d., for making drain 3 ft. deep (labour only); 9d., for pulling up old curb and laying new.

LUTON.—For constructing a service water-tank, and providing and laying two cast-iron water mains, at Luton, Bishopsteignton, Devon, for the Newton Abbot Union Rural Sanitary Authority. Mr. Raoul Sugar, surveyor, Union-street, Newton Abbot:—

Garton & King	£545 0 0	Parker Bros.	£429 0 0
A. Best	498 0 0	Robt. Hall, Ideford, Chudleigh (accepted)	362 4 0
W. J. T. Marden	497 0 0		

NEWCASTLE-ON-TYNE.—For alterations, &c., to premises, 30, Grainger-street, Newcastle-on-Tyne, for Messrs. Thomson & Macrachi. Mr. J. Ernest Stout, architect, Commercial-chambers, South Shields:—

Tyrie & Graham	£660 0 0	Edward Westherley	£500 0 0
John Brooks	665 15 0	James Smart	490 0 0
Alex. Pringle	606 0 0	Thomas Weatherilt, Newcastle*	494 10 0
John Jackson	592 11 3		
Haswell & Waugh	545 0 0		

* Accepted.

[illegible] Steam Cooking, &c. [illegible]

Benham & Son	£300 0 0	Emley & Son, Newcastle (accepted)	£230 16 8
Dinning & Cooke	249 10 0		

PONTYPRIDD.—For the construction of a road (13½ chains in length), at Clydach Vale, near Pontypridd, for the Cambrian Building Society. Mr. R. S. Griffiths, architect, Glyn Cottage, Clydach Vale, near Pontypridd:—

W. Willis	£339 8 0	T. Williams, Brynmawr (accepted)	£265 7 6
T. Morgan	308 1 11		

RICHMOND.—For new outfall sewer, across Richmond-green, for the Richmond (Surrey) Urban Sanitary Authority. Mr. Walter Brooke, C.E., Town Surveyor, Lower Mortlake-road, Richmond:—

	1st Tender.	2nd Tender.	Pr. ct.
W. J. Botterill	£8,895 0 0	£8,785 0 0	20 on.
Leonard Bottoms	6,157 0 0	6,127 0 0	—
Cook & Co.	6,072 0 0	6,451 0 0	—
A. Kellett	8,068 16 10	8,048 16 10	10 on.
D. W. Lewis (accepted)	5,898 0 0	5,898 0 0	10 off.
Nowe & Son	9,627 0 0	9,517 0 0	10 off.
Nowell & Robson	6,771 0 0	6,661 0 0	—
Tomes & Wimpey	6,960 0 0	6,800 0 0	—

[Surveyor's estimate, £6,120].

ST. AUSTELL.—For the renovation and addition of the Bible Christian Chapel, at Bugle, St. Austell. Mr. F. C. Jary, architect, Tregonissey, St. Austell:—

Taylor & Sons, *Joint Tender*	£675 0
W. H. Smith, *Carpentry and Painting*	421 11
R. Tutheway, *Carpentry and Painting*	395 0
T. J. Smith, St. Austell, *Carpentry and Painting* (accepted)	377 0
J. Stoutridge, *Carpentry and Painting*	310 0
J. Jacobs, *Masonry*	264 10
Jonathan Warne, Bugle, *Masonry* (accepted)	253 5

SANDIACRE.—For the construction of a covered reservoir at Sandiacre. Mr. W. H. Radford, engineer, Nottingham:—

J. Hawley & Son	£1,376 18 10	H. Vickers	£897 0 0
J. F. Price	969 0 0	J. Tomlinson	884 0 0
D. Barry	949 2 0	B. Keeling	880 0 0
W. E. Shaw	940 0 0	Holmes Bros.	857 5 0
A. Faulks	940 0 0	H. Shardlow	817 0 0
J. Hodson & Son	919 0 0	G. F. Todd (accepted)	739 0 0

SHIRLEY (Hants).—For additions and alterations to police-station at Shirley, Southampton, for the Hants County Council. Mr. James Robinson, County Surveyor, 13, Southgate-street, Winchester:—

T. Ware	£498 0 0	Wilt	£460 0 0
Crook & Son	497 0 0	Humber	449 18 0
Cawte	476 0 0	Filsell & Co., Exmoor-road, Southampton*	448 17 6
C. Barter	470 0 0		
W. Franklin	466 0 0	A. Warden	399 0 0

* Accepted.

STAPLEFORD (Nottingham).—For laying iron water-mains at Stapleford & Sandiacre. Mr. W. H. Radford, engineer, Nottingham:—

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D. Barry	790 15 0	G. F. Todd	544 0 0
H. Shardlow	761 17 0	J. F. Price (accepted)	460 0 0
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Wright Bros.	£769	Eldridge*	£588
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Turner	5,212	Webster & Cannon	4,320
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